

In this issue:

- Predicting How Biodiversity Affects Disease: Dr. Lisa Belden's Research (page 2)
- In Memoriam: Bruce Wallace and David West (page 3)
- New Grants (page 4)
- Meet our newest department members (page 5)
- Recent Defenses (page 6)
- New Classroom Building (page 7)
- Retirements (page 8)
- Awards (pages 9 - 11)

Greetings from your home department in Blacksburg! We appreciate you taking a few minutes – or more – to leaf through the latest newsletter. We hope you like the new format – twice the number of pages to accommodate more pictures and a larger font, thanks to advice from that Alumni Advisory Board (see below). What has not changed are the stories, including insights into some of the remarkable work being done by our research groups; this issue includes a focus on the work by Lisa Belden's group on connections between biodiversity and disease that has taken them to some very intriguing tropical locations. You'll also see updates on faculty, staff, and student achievements, including several new research grants, and learn about the retirement of three long-time members of the department.

One other thing I'd like to change is to include more news on the achievements of our alumni. New graduates know that we're serious about staying – and in many cases still getting – in touch! We really need to hear from you – not just to showcase individual accomplishments but to let our more recent graduates know what's possible with a Biology/Biological Sciences degree.

Help us forge another great improvement in this newsletter this fall with a line or two of news – professional or personal – from you. You can send your information to vsutherland@vt.edu or join us on LinkedIn and post your professional accomplishments there. Every university is defined by its graduates – and with 10,000 living alumni, that is also certainly true of our department.

We look forward to hearing from you!

Brenda S. Winkel

Brenda Winkel
Department Head



(Left) Biological Sciences Alumni Advisory Board members (left to right) Edward Goyette (President of American Biosystems; chair), Betsy Hagan (Senior Associate Dean Emeritus, VCU School of Dentistry), Jennifer Sheets (Jennifer P. Sheets Consulting), Assistant Professor Greg Valdez, Mark Latimer (Latimer IP Law), and Adrienne Hoffman (Teacher, Potomac Falls High School), participated in the spring board meeting on March 28th, which included a fascinating introduction and tour of the VT Carilion Research Institute by Executive Director Mike Friedlander (right). Not present were Board Members Jean Garrett (Clinical Scientist, LabCorp), Debbie Koller (Senior Principal Scientist -Retired, Altria), Carole Pratt (DDS, Virginia Oral Health Coalition), Shawn Semones (Director of R&D, Novozymes).



Join us on
LinkedIn

We welcome comments and items of interest for future newsletters. Please contact Valerie Sutherland (vsutherland@vt.edu) via e-mail, or write to us at the Department of Biological Sciences, Mail Code 0406, Virginia Tech, Blacksburg, VA 24061.

Predicting How Biodiversity Affects Disease

By Marlene Cimon, National Science Foundation

In ecology, as in many scientific fields, researchers like to develop general rules to explain why certain things happen in nature, and to make predictions. The reality, however, is often more complicated. For example, when trying to understand “communities” of species that make up biological systems, general rules don’t always apply.

The Uniqueness of Communities

“The predictive framework often has to be system specific,” says **Lisa Belden**, a community ecologist who primarily studies disease ecology. “If we are going to make predictions about what’s going to happen in a natural system as we lose species, we need to understand the natural history of the organisms that live there, the roles of the individual species within the community, and the way those species interact. Understanding each system is important.”

Belden, associate professor of biological sciences at Virginia Tech, is researching two such specific systems related to the ecological interactions that influence disease. The goal is to better understand how changes in biodiversity, in particular species loss, affect disease outcome.



Impacts on People

These are especially important in terms of disease because “we are seeing more and more zoonotic disease outbreaks every year, where pathogens move from other animals into humans,” Belden says. “People are saying: where did this come from? More people are interacting with wildlife, and if we don’t understand the wildlife component, we can’t understand the human component — we won’t be able to put those pieces together in order to control these pathogens and limit their impact on people.”

One of her projects involves the complicated life cycle of freshwater trematodes, a diverse set of parasitic flatworms that typically infect three hosts — sometimes including humans — as part of their reproductive life cycles. Her second study is looking at the role of symbiotic skin microbes in preventing amphibian infection by chytrid, a lethal fungus that has driven many amphibian populations to extinction. The National Science Foundation (NSF) is funding both projects with grants totaling \$1.5 million.

“Historically, we’ve viewed disease from thinking, primarily, that there is one organism, a pathogen or parasite, that causes disease and a host that gets it, particularly from a human perspective,” Belden says. “But in recent times, we’ve come to realize that interactions around the host and the pathogen are more complicated, and that environmental factors also can be important.”



Both studies ask how “community structure” affects the function of the biological system, with community structure defined as the relative abundances of the different species in the system. “As you start taking species out of communities, what happens to the function of the communities?” she says.

With amphibians, for example, “we already know that some of these skin bacteria do a good job of producing anti-fungal compounds,” she says. “These are naturally-occurring bacteria on the amphibians, but we don’t know how they get them. We don’t know whether they are derived from the environment, or whether they are passed from frog to frog. What we certainly do know is that these bacteria produce antifungal compounds and can inhibit the growth of the chytrid fungus.”

Thus, in studying these bacterial communities, “we are interested in disease resistance function,” she adds. “Is the function linked to the presence of a particular [bacterial] species on the skin of the frog? What happens if you lose

the species? Do you lose the function?”

How Does Diversity Help?

Alternatively, diversity in and of itself could be protective, that is, “the fact that you have a lot of species present and interacting on the skin, or the fact that they take up all the space and block other things from coming in,” Belden says. “In that case, what would matter is the overall loss of species — not the loss of any particular species. It could be that these antifungal compounds are produced by many species.”

Interestingly, Belden’s research parallels growing scientific interest in the human microbiome, where studies are examining how naturally-occurring bacteria affect numerous aspects of human health. “The microbiome is bringing in this new age of how we think about medicine,” she says. “It’s interesting how all this research is coming together, and how we are starting to think of human medicine in this broader framework of how species interact with one another, and the role of these microbial passengers.”

Experimenting to Identify Interactions

Belden's experiments involve exposing three different species of amphibians to the fungus after the researchers have surveyed the bacterial populations on their skin. "The idea is to see what happens, and track both the structure and function of those microbial communities," she says. Ultimately, "one of the things we are hoping to do at some point is treat vulnerable amphibians with probiotics to have a better defense against chytrid," she says.

With the flatworms, Belden's team is looking at similar questions relating to how different species within the complex communities where they live have an impact on their life cycles, for instance, what happens when a predator consumes potential hosts in the parasite life cycle.

"They have three hosts, and all must be present for the parasite to complete its life cycle," she explains. "First there is the adult worm, which reproduces in a vertebrate intestine — often a muskrat or duck for the parasites we study. The eggs are in feces. Then they have to go into an aquatic snail, where they reproduce asexually. They consume the gonads of the snail so the snail cannot reproduce — they take over the snail, like the invasion of the body snatchers. Then there is another free-living parasite stage that must infect another host — another snail, or a tadpole — where they form a little cyst and sit there until the snail, or tadpole, is consumed by another muskrat or a duck. Then they become adult worms, and it starts all over again." as we confront the challenges of biodiversity loss and climate change. These are big challenges, and if we want to mitigate the impacts, we have to understand what is changing. We can't do that unless we understand the systems."



Belden Lab graduate students Daniel Medina (left) and Angie Estrada, both of Panama City, Panama, search for frogs off Pipeline Road in Soberania National Park in Gamboa, Panama. Photo courtesy Lindsay Key

For more information on research in the Belden Lab, visit <http://www.belden.biol.vt.edu>

In Memoriam



J. Bruce Wallace, University Distinguished Professor Emeritus at Virginia Tech and Professor Emeritus at Cornell University, died Jan. 12 in Blacksburg at the age of 94. Born and raised in McKean, Pennsylvania, he received his bachelor's degree in 1941 and Ph.D. in 1949, both from Columbia University, in the interim serving in the Army during World War II under Robert McNamara.

He took a position at, and later was assistant director of, the prestigious Cold Spring Harbor Biological Laboratory. In 1958, he joined Cornell University as professor of genetics, retiring in 1981 to join the Department of Biology at Virginia Tech. He became a University Distinguished Professor of Biology in 1983 and remained an active member of the faculty until 1994.

Wallace was a world-renowned pioneer in the study of the genetics of natural populations. In 1970 he was elected to the National Academy of Sciences. He served as president of several professional societies and editor for *Evolutionary Biology*. During his later years, Wallace focused his attention on complex environmental and associated societal issues and became a passionate advocate for environmental literacy. He wrote more than 100 research articles, mostly in the field of *Drosophila* population genetics, and 15 books, many translated into other languages.

Wallace was known as a highly engaged member of the faculty who enriched the intellectual climate and the professional lives of students and faculty alike. He traveled the world as a visiting scholar, frequently with his wife and two children. Following retirement Wallace continued to enjoy listening to music, playing harmonica, and watching the wildlife that populated his backyard. He recently published two small books of fictional tales set in Blacksburg.



David A. West, Associate Professor Emeritus of Biology, died April 2 at his home in Blacksburg. He was 81 years old. West was born and spent his childhood in Beirut, where his father and grandfather both taught at the American University. He married Lindsay Lattimore Butte in New York City in 1958 and received his Ph.D. in ornithology from Cornell University in 1959. West came to Virginia Tech in 1962 where he taught biology and genetics until his retirement in 1998.

Faculty colleague Bob Benoit wrote a remembrance titled "A Biology Professor for All Seasons." He wrote, "David was elected year after year to the biology department's executive committee because he was the wise intellectual who had a vision of the university beyond narrow department personal goals. He was committed to the tripartite university mission of teaching, research, and service. He was a popular genetics professor who received several teaching awards. Students knew from battle reports that there were no easy A's in any Dave West course."

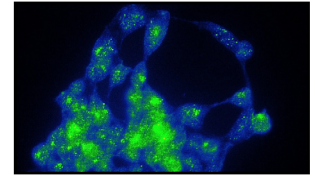
In retirement, West pursued interests in music, reading, travel, and the local mountains, helping secure wilderness designation for additional areas in the Jefferson National Forest including Brush Mountain.

New Grants

Novel Innate Receptor for the Fungal PAMP Chitin (National Institutes of Health, \$426,629, 2 years)

Principal Investigator: **Christopher Lawrence** (Associate Professor of Biological Sciences) and Co-PI **Liwu Li** (Professor of Biological Sciences)

Westernized countries are experiencing striking increases in the prevalence of asthma. Successful completion of this project will increase our understanding of the pathogenesis mechanisms of the allergic asthma-associated fungus, *Alternaria*, and other chitin-containing pathogens. Successful execution of this project may provide insight into the design and implementation of novel therapeutic approaches for prevention and treatment of allergic asthma and other Th2-driven inflammatory diseases.



Novel receptor for the carbohydrate chitin (found in pathogen cell walls) localized to plasmamembrane of human lung epithelial cells. Confocal fluorescent microscopy was used to visualize the receptor protein.



Linking Land-Use Decision Making, Water Quality, and Lake Associations to Understand Human-Natural Feedbacks in Lake Catchments (National Science Foundation, \$1,800,000, 3 years)

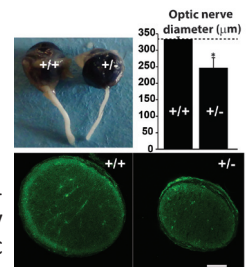
Principal Investigator: **Cayelan Carey** (Assistant Professor of Biological Sciences)

In this project, Drs. Cobourn, Carey, and colleagues are studying how human activities in the catchments surrounding lakes contribute to eutrophication and the growth of harmful algal blooms, which threaten water quality globally. However, such degradation can generate a strong incentive for behavioral change. For example, citizen-driven lake associations, which often form in response to deteriorating water quality, have gained increasing momentum as a catalyst to effect changes in management and policy to protect lake water quality. In this project, Carey and Cobourn will lead a team with colleagues from the University of Wisconsin, Penn State, Michigan State, and the Cary Institute of Ecosystem Studies to examine the linkages between land-use decision making, lake water quality, and the amenities that people value in three contrasting, focal lake catchments. In each catchment, new data from lake associations will provide understanding into how people collectively act in response to changes in water quality and how their activities influence the behavior of citizens and policymakers. The insights from the three focal catchments will in turn inform the study of human-natural system dynamics across thousands of lake catchments spanning the northeastern and midwestern U.S.

Investigating the Mechanism of Optic Nerve Hypoplasia Associated with CASK Mutation (National Institutes of Health, \$2,000,000, 5 years)

Principal Investigator: **Konark Mukherjee** (Assistant Professor, Virginia Tech Carilion Research Institute, Biological Sciences) Co-PI: **Michael Fox** (Associate Professor, Virginia Tech Carilion Research Institute, Biological Sciences)

Optic nerve hypoplasia is one of the most common congenital disorders of the optic disc and an increasingly prevalent cause of childhood blindness. Not much is known about this pervasive disease with very few animal models available. In our current proposal we describe a new animal disease model of optic nerve hypoplasia in the form of CASK mutant mice.



Using Social Network Models and Manipulations of Glucocorticoids to Understand How the Social Environment Impacts Neural Function (Jeffress Memorial Trust, \$100,000)

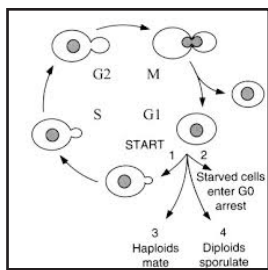
Principal Investigator: **Kendra Sewall** (Assistant Professor of Biological Sciences)

This study will examine the costs and benefits of social behavior to cognition and brain function in zebra finches—a highly sociable bird that lives in a range of flock sizes, from pairs and small family groups (2-4 birds) to large aggregate flocks (up to 100 birds). This work has relevance to wild animal populations and perhaps even humans because affiliative social behavior, which often accompanies a large flock size, is associated with superior cognitive abilities, larger brains, and enhanced neuronal architecture. However, if social behavior becomes chronically stressful, perhaps due to overcrowding or intense competition, a stress hormone called glucocorticoid is produced. In high amounts, this hormone can impair neural plasticity and compromise brain function. By manipulating group size and using pharmacological control of stress hormones, Sewall's group will be able to tease apart the interplay of social stress and social enrichment on brain function.

New Grants (con't)

Stochastic Models of Cell Cycle Regulation in Eukaryotes

(National Institutes of Health, \$2,250,000, 4 years)



PI: Jean Peccoud (Professor, VBI); Co-PI: **John Tyson** (University Distinguished Professor of Biological Sciences)

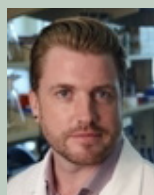
The cell division cycle underlies all processes of biological growth and reproduction, and mistakes in cell growth and division cause many serious health problems, especially cancer. Mutations in checkpoint mechanisms are well known to cause genomic instability, leading (it is thought) to an avalanche of new mutations, some of which may transform normal cells into cancer cells. However, most checkpoint failures are lethal, and checkpoint “fragility” (whereby checkpoints fail in a random fashion, from one cell to another, because of molecular fluctuations) may be an underappreciated mechanism of cancer progression in a clonal line of mutant cells. Hence, a better understanding of checkpoint robustness and fragility, i.e., of the effects of noise on cell cycle progression in normal and mutant cells, may improve our understanding of the etiology and treatment of cancer cells.

Meet our newest department members!



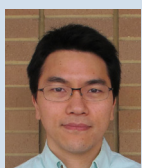
Shihoko Kojima, Assistant Professor of Biological Sciences, joined the department in December 2014. She earned her Ph.D. in Human Genetics at the University of Tokyo then pursued postdoctoral research at the University of Tokyo and the University of Virginia. She later held an instructor position at the University of Texas Southwestern

Medical Center and, lastly, as an investigator at the International Institute for Integrative Sleep Medicine at the University of Tsukuba. Dr. Kojima’s major field of interest is mammalian circadian biology.

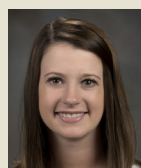


James Smyth, Assistant Professor of Biological Sciences and member of the Virginia Tech Carilion Research Institute, joined the department in July 2014. He earned his Ph.D. in Virology from Trinity College Dublin, and pursued postdoctoral research at the University of California-San Francisco and at the Cedars-Sinai Heart Institute in Los Angeles.

Dr. Smyth’s major field of interest is developing effective anti-arrhythmic treatments for heart failure.



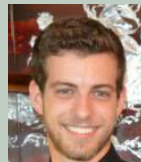
Wooram Lee was appointed as General Biology Laboratory Coordinator in March 2014. He received his M.S. in Biological Sciences from Iulia Lazar’s lab in 2014. Wooram supports the development and delivery of the freshman laboratories by managing equipment and supplies and overseeing the graduate teaching assistants.



Megan Lusk, Receptionist in the Business Office, joined the department in December 2014. She attended New River Community College, and has several years of experience working in busy office situations.



Stacie Quesenberry, Assistant Business Manager, joined the department in June 2014. She has a BBA in Accounting from Radford University, and has 15 years of experience working in both the private sector and for the Virginia Tech Foundation.



Justin Scarborough, IT Support Specialist, joined the department in June 2015. He is currently completing his BS in Information Technology through Colorado State University, and he has several years of customer service and computer support experience.



Kenneth Smith, Equipment Service and Repair Technician, joined the department in March 2015. Before joining us, Kenny was employed by the Virginia Tech Police Department; he has also worked as an electrician for VT Facilities. He is responsible for maintaining and servicing various teaching and research equipment.



Becky Zimmerman, Teaching Laboratories Operations Manager, joined the department in August 2014. She has a variety of experience in environmental laboratories and in K-12 instruction; in our department, she provides administrative, logistical, safety, and fiscal support to the department’s teaching lab programs and courses.

Recent Defenses

Many of our graduate students earned M.S. or Ph.D. degrees in the past year and have gone on to exciting new challenges:

M.S. defense by **Katlyn Amos** (Benfield Lab), entitled, "Investigating historical and contemporary land cover effects on macroinvertebrate communities and water quality of Virginia Piedmont streams" (07/21/2014). Currently a Research Specialist in the Department of Entomology at Virginia Tech.

M.S. defense by **Tessa Arnold** (Phillips Lab), entitled, "The Mouse Magnetic Compass" (05/22/2015). Plans to work in the biomedical field while applying to Physician Assistant Programs.

Ph.D. defense by **Zhe Bao** (Nilsen Lab), entitled, "Biotic interaction of invasive, early-succession trees and their effects on community diversity: a multi-scale study using invasive *Ailanthus altissima* and native *Robinia pseudoacacia* in eastern deciduous forests" (01/30/2015)

Ph.D. defense by **Matthew Becker** (Belden Lab), entitled, "The role of symbiotic bacteria in disease resistance and conservation of the critically endangered Panamanian golden frog" (08/04/2014). Currently a postdoctoral fellow at the National Zoo in Washington, D.C. on a Smithsonian Institution Fellowship.

Ph.D. defense by **Casey Bernhards** (Popham Lab), entitled, "Regulation of the spore cortex lytic enzyme SleB in *Bacillus anthracis*" (08/25/2014). Currently a National Research Council/DTRA Postdoctoral Fellow at the U.S. Army Edgewood Chemical Biological Center in Aberdeen, MD.



M.S. Defense by **Mary Kate Brannon** (Capelluto Lab), entitled, "Binding properties of the adaptor proteins Tollip and Tom1" (04/16/2015). Currently working in the veterinary field while applying to veterinary school.

Ph.D. defense by **Yan Chen** (Popham Lab), entitled, "Characterization of Bacillus spore membrane proteomes and investigation of their roles in the spore germination process" (09/05/2014). Currently a postdoctoral fellow at Johns Hopkins University in Baltimore, MD.

Ph.D. defense by **Sarah Foltz** (Moore Lab), entitled, "Going to town: comparing the behavior, physiology, and reproduction of urban and rural song sparrows (*Melospiza melodia*)" (04/22/2015). Will be an instructor in the Department of Biology, Radford University, starting in fall semester.

Ph.D. defense by **Vicki Garcia** (Walters Lab), "Lifetime fitness and changing life history traits in Red-cockaded Woodpeckers," (12-15-14). Currently at Old Dominion University on a joint project with Cornell University, supported by an NSF postdoctoral fellowship.

Ph.D. defense by **M. Camille Harris** (Hawley Lab), entitled, "Forest disturbance, mosquito vector ecology, and La Crosse virus dynamics in southwestern Virginia" (08/15/2014). Currently a Wildlife Disease Coordinator/Interdisciplinary Biologist, at the US Geological Survey Ecosystems Office, Washington, D.C.

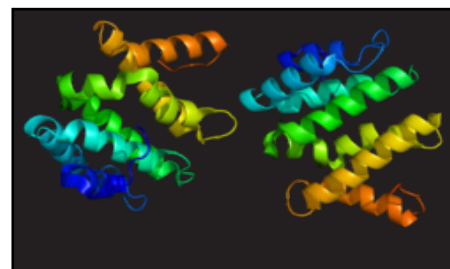
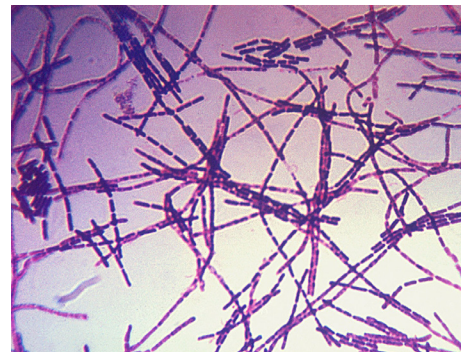
Ph.D. Defense by **Bin He** (Cimini Lab), entitled, "Mitotic dynamics of normally and mis-attached chromosomes and post-mitotic behavior of missegregated chromosomes" (04/28/2015). Currently completing M.S. degree in computer science at Virginia Tech, which this summer includes a full time data science intern position at Meridium, Inc., in Roanoke, VA.

Ph.D. Defense by **Julia Kamenz** (Eberhard Karls Universitat Tübingen, Hauf Lab), "Temporal coordination of the metaphase to anaphase transition," (02/18/2015). Currently a postdoctoral fellow with James Ferrell at Stanford University School of Medicine.

Ph.D. Defense by **Lukas Landler** (Phillips Lab), entitled, "Spontaneous directional preferences in taxonomically and ecologically distinct organisms: examining cues and underlying mechanisms" (03/23/2015). Currently a Research Assistant at the Research Institute of Molecular Pathology in Vienna, Austria.

M.S. Defense by **Usha Loganathan** (Mukhopadhyay/Popham Labs), entitled, "Characterization of the Thioredoxin System of *Methanosarcina mazei*" (12/01/2014). Currently a laboratory technician in the Department of Biochemistry at Virginia Tech.

M.S. Defense by **Kristen Muller** (Benfield Lab), entitled, "Impacts of land-use on leaf breakdown and macroinvertebrate assemblages in Southern Appalachian streams" (12/01/2014). Currently an Adjunct Instructor in the Department of Natural and Applied Sciences at Northern Virginia Community College-Loudoun Campus in Sterling, VA.



(continued on next page)

New Classroom Building



A view of the construction site taken from Derring Hall in July 2015.



A conceptual design drawing of the completed Classroom Building.

Construction began in early November on the much-anticipated Classroom Building, located adjacent to Derring Hall on West Campus Drive. The \$42 million, three-story, 73,400-square-foot facility, is set to open in 2016. It will contain 15 classrooms and four teaching laboratories with seats for more than 1,450 students, as well as study rooms and group meeting space.

The Classroom Building will provide a high-quality learning space to fit the needs of an increasingly interactive and technology-driven academic environment. The building will include rooms that can be subdivided and readily reconfigured as the instructional needs, technologies, and teaching methods change over time. Some rooms will be configured as SCALE-UP classrooms, which help encourage more interaction and shared learning among students.

"The flexible design of the Classroom Building ensures that we will be able to offer students state-of-art learning experience not only today, but for decades to come," says Mark McNamee, senior vice president and provost. "The new features will create space that promotes collaborative learning and supports faculty in their efforts to move beyond the traditional lecture."

The location of the Classroom Building adjacent to other instructional buildings is intended to minimize travel time between classes for students and faculty. The location is also convenient to students commuting from off-campus.

The new building was designed by EYP Architecture & Engineering and will be constructed to LEED certification standards, a designation given by the U.S. Green Building Council for structures that use the very best in energy and environmental design.

-Adapted from an article by Bob Spieldenner and Alison Matthiessen

For more information on the ongoing construction of the Classroom Building, including links to webcams and time-lapse slide shows, visit: http://www.pdc.facilities.vt.edu/mediawiki/index.php?title=Classroom_Building

(continued from previous page)

M.S. Defense by **Sarah Nikraftar** (Melville Lab), entitled, "Localization of Type IV Pilin Polymerization Proteins in *Clostridium perfringens*," (12/8/14). Currently working as a volunteer in the Melville lab.

Ph.D. Defense by **Joshua Nicholson** (Cimini Lab), entitled, "The effects of chromosome number changes on mitotic fidelity and karyotype stability" (05/4/2015). Currently CEO and Co-founder at The Winnower, New York, NY.

M.S. Defense by **Samuel Rutledge** (Cimini Lab), "Investigating aneuploidy's role in cancer cell fitness under various conditions of stress," 06/30/2015.

Ph.D. Defense by **James Skelton** (Brown Lab), entitled, "Towards an understanding of symbiont life history through studies of crayfish and their annelid associates" (02/27/2015). Currently a postdoctoral fellow with Jeff Walters; moving to a postdoctoral position at the University of Florida in the fall.

Ph.D. Defense by **Kartik Subramanian** (GBCB, Tyson Lab), entitled, "Spatiotemporal model of the asymmetric division cycle of *Caulobacter crescentus*," (09/03/2014). Currently a postdoctoral fellow with Peter Sorger in the Department of Systems Biology, Harvard Medical School.

M.S. defense by **Alex Sumadijaya** (Hilu Lab), entitled, "Morphology and molecular phylogeny of the compilospecies complex (Poaceae, grasses) with a focus on Australia" (05/05/2015). Currently a Plant Taxonomist at the Research Center for Biology, Indonesia Institute of Sciences, Cibinong Science Center, West Java, Indonesia.

Ph.D. defense by **Jenifer Walke** (Belden Lab), entitled, "The structure and function of amphibian bacterial symbionts and their role in susceptibility to a fungal pathogen" (07/23/2014). Currently a Visiting Assistant Professor, Roanoke College, Roanoke, VA



Retirements



Arthur L. Buikema Jr., Alumni Distinguished Professor of Biological Sciences, has been conferred the title of “Alumni Distinguished Professor Emeritus” by the Virginia Tech Board of Visitors.

A member of the Virginia Tech community since 1971, Buikema is widely known as an innovative teacher of a range of courses from freshman biology, including courses for University Honors, to the advanced graduate level. He has taught multiple courses in other departments and colleges in the university and was the co-architect of a Virginia Tech general biology laboratory manual. He has received numerous professional and university awards for his teaching, including the William E. Wine Award, the Sporn Award for Teaching Introductory Subjects, and the Diggs Teaching Scholar Award.

For more than 25 years, Buikema conducted basic ecology and aquatic pollution research. He has taught field biology courses in the Boundary Waters Canoe Area and the Everglades. Buikema was the advisor to many undergraduate and graduate students during his career. He served as the graduate advisor for 21 master’s degree and nine doctoral degree students and served on multiple graduate advisory committees in the Department of Biological Sciences and other departments.

Buikema has written approximately 115 peer-reviewed research papers and book chapters and has presented research papers at more than 200 regional, national, and international scientific research conferences. He has received funding from several state and federal agencies to support his research. In addition, he has served as a senior scientific advisor to the U.S. Environmental Protection Agency and was a Senior Fulbright Scholar to Zimbabwe. In 2000, Buikema was invited to give Virginia Tech’s fall University Commencement address.

Buikema received a bachelor’s degree from Elmhurst College and a master’s degree and Ph.D. from the University of Kansas.



Dr. Buikema is pictured here a year or two before coming to Virginia Tech.



Jackson R. Webster, professor of biological sciences, has been conferred the title of “Professor Emeritus” by the Virginia Tech Board of Visitors.

A member of the Virginia Tech community since 1975, Webster has established himself as an exceptional teacher-scholar. He has taught a variety of courses ranging from junior to the advanced graduate level for the Department of Biological Sciences. He has been an advisor to many undergraduate and graduate students during his career, serving as a graduate advisor for 17 master’s degree and 10 doctoral degree students. He also has served on graduate advisory committees in several other departments and colleges.

In 2012, Webster was honored with Virginia Tech’s William E. Wine Award in recognition of his outstanding work in the classroom.

Webster is an accomplished researcher in the areas of ecosystem-level processes of aquatic ecosystems, biogeochemistry of streams, and riparian-stream interactions. In his career, he has secured more than \$6 million as a principal or co-principal investigator on grants and another \$32 million as a contributing member of research teams involving other universities. He has published more than 100 peer-reviewed papers and 35 book chapters. One of his papers was published in *Science* and another was published in *Nature*, the leading journals in the scientific community. He has served as an associate editor for three professional journals and on state and national technical advisory boards and committees.

Webster received his bachelor’s degree from Wabash College and his Ph.D. from the University of Georgia.



Dr. Webster on his first day of work at Virginia Tech in 1975.



Jacob Waller, equipment repair and laboratory safety specialist, retired in June after 30 years at Virginia Tech. A member of the department since 1985, Waller was responsible for servicing all the equipment, spread among seven buildings, in one of the largest departments at the university. He also served as the liaison between Biological Sciences and the Department of Environmental Health and Safety Services, chaired the department’s safety committee, and trained faculty, students, and staff on safety issues and policy changes, in addition to tracking down thousands of pieces of equipment during the university’s biennial inventory certification process. His technical expertise saved the department thousands of dollars each year by repairing, rather than replacing, equipment.

In addition to his responsibilities in the department, he was the advisor and an instructor for the Virginia Tech SCUBA Club. He was (and continues to be) a volunteer with the Virginia Tech Rescue Squad and was among the first responders who provided support on April 16, 2007. He was recently honored by induction as one of the select few “life members” of the Squad after nearly a decade of service, together with his wife, Kristi DeCourcy. In 2010 he received the President’s Award for Excellence, presented annually to up to five Virginia Tech staff employees who have made extraordinary contributions to the university. Jake is pursuing a second career as an emergency room technician.



Jake and his dog, Shannon, circa 1988.

Awards

The **Biological Sciences Diversity Committee** has been recognized with the **2015 Diversity Award from the College of Science**. This committee was established in 2002 by then-department head, **Bob Jones**. Dr. Jones, who is now Provost at Clemson University, placed an enormous premium on valuing and promoting diversity in the department and across the campus, already establishing this committee in his second year as head and at a time when programs that are now a mainstay of diversity efforts on our campus, e.g., AdvanceVT, did not yet exist. Even the "Virginia Tech Principles of Community" were only adopted three years later. We are proud that our committee has been part of a gradual and yet ultimately profound change over more than a decade in how we address issues of diversity on our campus and what is now a major priority for President Sands's administration.



Grad students enjoying the Annual International Potluck Luncheon, sponsored by the BIOL Diversity Committee

From its inception The Biological Sciences Diversity Committee enthusiastically embraced the challenge of raising awareness and understanding of diverse ethnic, cultural, and gender perspectives, while actively promoting and celebrating diversity. Together, the members of this committee created a sustained focus on building diversity awareness for faculty, staff, and students that has been felt not only in the department, but across the campus. A remarkable number of original activities have been developed over the past thirteen years, several of which are traditions that now help define who we are. Particularly noteworthy are the annual international potluck luncheon, the "Strategies for Effective Interaction" sessions, and, for the past four years, organization of the Annual Martin Luther King Jr. week seminars. The department is very pleased that the committee's endeavors have been recognized by the college and looks forward to benefiting from their efforts for many years to come.



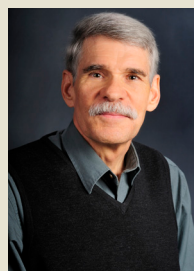
Drs. Sharon and Craig Ramey, professors and distinguished research scholars at the Virginia Tech Carilion Research Institute, presented two seminars as part of the Fourth Annual Martin Luther King Jr. Week Seminars in 2015. The Rameys knew Dr. King and have been highly involved nationally in promoting and addressing issues of health disparities and race in the United States.



Associate Professor **Carla Finkelstein** has received the university's 2015 Alumni Award for Outreach Excellence. Finkelstein, who has an active teaching and research program, is a passionate advocate for breast cancer awareness and research. Her advocacy work has included support of state and federal bills that champion early breast cancer screening for women under 40. For the past three years, Finkelstein has co-organized Pretty in Pink, a fundraising event that brings Blacksburg merchants,

residents, and breast cancer survivors together to collect funds to defray the cost of mammograms for uninsured women. She established the Mobil Momm program, in which area physician and nurse volunteers together with breast cancer scientists and survivors visit rural communities to educate residents about the need for regular mammograms and to offer the service at no cost. She brings male and female survivors to campus each year for a series of lectures in breast cancer. Finkelstein engages her students in all of these activities to help them understand the importance of being active members of their communities.

-Adapted from an article by Mark Owczarski



Professor **Brent Opell** has received the university's 2015 William E. Wine Award.

Since joining the Virginia Tech faculty in 1978, Opell has taught more than 8,000 students, most of them in freshman- and sophomore-level courses. His teaching contributions have been recognized by two Department of Biological Sciences Undergraduate Teaching Awards and three College of Science Certificates of Teaching Excellence. Opell engages students in course material by integrating his research

and field experiences into class presentations. His use of real-world examples from his personal travels engages students. Outside the classroom, Opell mentors undergraduate students by involving them in his National Science Foundation-sponsored studies of spider evolutionary biology. These include studies of adhesion in the capture threads of spider orb-webs, with students as coauthors on many of the published papers. In addition to his teaching activities, Opell has served as an academic advisor since 1978, was a freshman advisor from 2002 to 2013, and serves as a pre-veterinary advisor.

-Adapted from an article by Mark Owczarski



Associate Professor of Biological Sciences/Virginia Tech Carilion Research Institute **Michael Fox** has been selected as the recipient of a 2015 Brain and Behavior Research Foundation (BBRF) NARSAD Independent Investigator award. The award is for \$100,000 for his work on, "Matricryptin – releasing collagens contribute to inhibitory synapse formation and complex brain disease." According to **Michael Friedlander**, Founding Director of VTCRI and Professor of Biological Sciences, "The BBRF scientific council selects the most promising ideas for NARSAD grants to independent and distinguished investigators. A NARSAD award is one of the highest distinctions in the field of mental health research, supporting some of the best researchers and ideas in brain research." And "This major recognition of Mike's work is very well deserved."

Dr. Fox was also recently selected for the International Society of Neurochemistry's Young Scientist Lectureship Award. The award recognizes "eminent research achievements of promising young scientists" and consists of an honorarium and a paid trip to present a talk at the 25th Biennial ISN Meeting in Cairns, Australia, in August.

2015 BIOLOGICAL SCIENCES AWARDS AND SCHOLARSHIPS

Undergraduate Awards and Scholarships

Biology Alumni Undergraduate Research Excellence Award (*Supported with discretionary funds contributed by former students, faculty and other donors; presented to outstanding undergraduate researchers*): **Jose Zuniga Arana**

Arthur Buikema and M. Alison Galway Outstanding Senior Award (*Established by Alumni Distinguished Professor Emeritus Art Buikema and wife Alison; presented to a graduating senior in recognition of academic achievement, leadership and service*): **Albert Hinman**

Arthur Buikema and M. Alison Galway Undergraduate Research Award (*Established by Alumni Distinguished Professor Emeritus Art Buikema and wife Alison; presented to outstanding undergraduate researchers*): **David Vasquez**

Ralph E. Carlson Memorial Freshman Scholarship (*Established by the late Elizabeth Bailey Carlson in honor of her husband, Ralph E. Carlson, former professor in the Pamplin College of Business; awarded to first-year students in Biological Sciences with high academic achievement*): **Kristen Fisher**

Ralph E. Carlson Memorial Scholarship in Ornithology (*Established by the late Elizabeth Bailey Carlson in honor of her husband, Ralph E. Carlson, former professor in the Pamplin College of Business; awarded to Biological Sciences students pursuing careers in ornithology*): **Grace Wilde and David Vasquez**

Joe and Barbara Cowles Scholarship (*Established by Professor Emeritus of Biological Sciences and Former Department Head Joseph Cowles and his wife Barbara Cowles, former Associate Director of the VT University Honors Program; awarded to undergraduate students who are planning to enter the fields of nursing, teaching, professoriate, or research*): **Valentina Alaasam**

Albert and Sharon Hendricks Undergraduate Excellence Award (*Established by Associate Professor Emeritus Albert Hendricks and wife Sharon; awarded to outstanding undergraduate researchers*): **Dylan Lescure and Jessica Li**

Rachael Hill Memorial Scholarship (*Established in honor of student Rachael Elizabeth Hill, who died during the tragic April 16, 2007 shooting at Virginia Tech; awarded to rising sophomore undergraduates with an high academic achievement and a record of University or community involvement*): **Vraj Patel, Elizabeth Lilly, and Hunter Jecius**

Robert Jones Undergraduate Research Excellence Award (*Established by former Professor of Biological Sciences and Department Head Robert H. Jones; awarded to outstanding undergraduate researchers in Biological Sciences*): **Brittany Blankenship**

Deborah Ayers Koller Scholarship (*Established by alumna Deborah Ayers Koller; awarded to Biological Sciences students with high academic achievement who are aspiring for a research career*): **Rose Peterson and Katelyn Catalfamo**

Stephen D. Lutz Scholarship (*Established by alumni Stephen Lutz; awarded to Biological Sciences students who are Virginia residents and have high academic achievement*): **Bishal Patel**

Stacey Smith Biology Research Excellence Award (*Established by alumna Stacey Smith; awarded to undergraduate Biological Sciences majors interested in pursuing a career in basic research who are currently engaged in undergraduate research*): **Elizabeth Brown**

I.D. Wilson Memorial Scholarship (*In honor of Dr. I.D. Wilson, former head of the Department of Biology; awarded to undergraduate Biological Sciences majors who are in their last year of study and plan on pursuing a career in veterinary medicine*): **Molly Delaney**

Graduate Awards and Scholarships

Arthur Buikema and M. Alison Galway Graduate Student Teaching Award (*Established by Alumni Distinguished Professor Art Buikema and wife Alison Galway; awarded to graduate teaching assistants for excellence in instruction*): **Alison Kernell Burke**

Lewis Edward Goyette Graduate Fellowship (*Established by alumni Edward Goyette in honor and recognition of his father, Lewis Edward Goyette; awarded to graduate students involved in the study of industrial microbiology*): **Alison Kernell Burke and Benjamin Webb**

Noel Krieg Graduate Fellowship (*Established by a group of former students in honor of Alumni Distinguished Professor Emeritus Noel Krieg; awarded to an outstanding graduate student in biological sciences*): **Jonathan Doubek**

John Palmer Memorial Scholarship (*Established by alumna Rhonda Leavenworth Johnson in honor of her uncle, John Gilbert Palmer, former Adjunct Professor of Biology; awarded to an outstanding graduate student in Biological Sciences*): **James Skelton**

Robert and Marion Paterson Scholarship (*Established in honor of Robert Paterson, Professor and Department Head of Biological Sciences, and wife Marion; awarded to an outstanding graduate student in Biological Sciences*): **Skylar Hopkins**

More Awards



Associate Professor **Lisa Belden** is one of four faculty members who received The Innovator Award, a new initiative jointly sponsored by the Institute for Critical Technology and Applied Science and the Fralin Life Science Institute, which recognizes outstanding faculty members and includes a \$25,000 stipend to be used to advance innovative research projects and team-oriented science.

"ICTAS and Fralin have joined to recognize and reward some of our outstanding faculty in a way they did not anticipate," said Dennis Dean, director of the Fralin Life Science Institute. "We have many terrific innovators at this university and by recognizing at least several such individuals on a recurring basis, we are sending the message that this university is aware of and appreciates innovation. A special aspect of the group recognized this year is their very visible collaborative and interdisciplinary approaches."

Art Buikema, Jack Evans, and Mike Rosenzweig all received Favorite Faculty Awards from VT Housing and Residence Life.

Art Buikema was named a VT Academy of Faculty Service Fellow.

Alison Kernell Burke, a Ph.D. student in **Ann Stevens'** lab, received the John Johnson Award for Graduate Student Excellence in Microbiology from the VT Interdepartmental Microbiology Graduate Program.

Cayelan Carey received the Outstanding Reviewer Award from the Journal of Plankton Research.

An image from Assistant Professor **Cayelan Carey's** paper on sloth/algae symbiosis in Proceedings of the Royal Society has been chosen by Wired magazine as one of the Best Science Visualizations of 2014.

Graduate student **Jon Doubek** of the Carey Lab received a Global Lakes Ecological Observatory Network Fellowship.

Associate Professor **Carla Finkelstein** received a 2015 Summer Scholars Program Award from the VT Institute for Society, Culture, and the Environment.

Dana Hawley received the 2014 Mitchell A. Byrd Award from the Virginia Society of Ornithology.

Khidir Hilu was named the VT CIDER (Center for Instructional Development and Educational Research) Teacher of the Week in January 2015.

Iuliana Lazar was named the VT Scholar of the Week in December 2014.

Graduate students **Ariel Leon** (Hawley Lab) and **Laura Schoenle** (Moore Lab) received VT Sigma Xi Outstanding Ph.D. Research Awards.

Jessica Li, recent B.S. graduate in biological sciences, was named the 2015 VT Undergraduate Student of the Year.

Assistant Professors **Cayelan Carey** and **Kendra Sewall** are recipients of the Fralin Life Science Institute's New Investigator Award, which recognizes promising first-time tenure-track faculty who have joined Virginia Tech within the last two years. This year the recipients each received \$10,000 to advance their research efforts as they see fit.



Dr. Carey is specializing in freshwater ecosystem ecology and is a faculty member of the Global Change Center at Virginia Tech. Her research integrates population, community, and ecosystem ecology to examine how natural and human-induced influences affect fresh water ecosystems.



Dr. Sewall is specializing in animal behavior and neurobiology; her research seeks to understand how neural and behavioral processes -- and the environmental and developmental factors that impact those processes -- contribute to animal survival and reproductive success.



Graduate student **Alexandra Gerling** of the Carey Lab was named the 2015 College of Science Outstanding Master's Student. Alex's research focuses on the effects of hypolimnetic oxygenation systems on water quality in reservoirs. She works closely with the Western Virginia Water Authority to analyze the effects of management on drinking water reservoirs in the Roanoke/Blacksburg area. Congratulations, Alex!



Graduate student **Laura Schoenle** of the Moore Lab was awarded a US Environmental Protection Agency's Science to Achieve Results or STAR program fellowship for outstanding environmental research for her study on stress hormones and disease in red-winged blackbirds. She will use the fellowship, which includes a \$25,000 stipend, to expand the study to look at how mercury and stress levels affect resistance and tolerance to avian malaria. Congratulations, Laura!



Michael Athanas, Senior IT Specialist, recently received the Roanoke Valley Red Cross Chapter's highest award, the Clara Barton Honor Award for Meritorious Volunteer Leadership. Michael has been involved with the Virginia Tech Red Cross Club since 2006, and has served as Vice-President and President of the club. He is currently the club's Staff Advisor, and for the past two years has served as club liaison on the Roanoke Valley Chapter's Board of Directors. Congratulations, Michael!

Department of Biological Sciences
Mail Code 0406
1405 Perry Street
Virginia Tech
Blacksburg, VA 24061
(540)231-8930

Department of Biological Sciences ***Annual Fund***



One person can make a big difference!

The Department of Biological Sciences has a rich history, a strong international reputation, and a bright future. The department oversees the largest degree-granting program at Virginia Tech, with more than 1700 student majors, and also provides instruction to thousands of students, both within the major and from across the college and university. Our undergraduate and graduate degree programs prepare society's future scientists. And our outstanding faculty members conduct cutting-edge research that impacts society as a whole.

Your support is critical to our success. Any monetary contributions you make could be used to support deserving students, provide necessary equipment, or extend our research activities. This year we are focusing our fundraising efforts on two important funds – The Department of Biological Sciences Research Day Fund (876105) and the Department of Biological Sciences General Fund (881317).

When you receive your College of Science Annual Fund letter or phone call, please earmark your support for the Department of Biological Sciences and one of these special funds. Simply make a notation on the gift card or let the caller know that you want to direct your donation to the Biological Sciences Department and then include the specific fund name and number. To make an immediate contribution, you may visit the university's web site at www.givingto.vt.edu or contact the Office of Gift Accounting at (800) 533-1144.

For more information about these funds or to learn more about other ways to give, please contact Jenny Orzolek, Director of Development for the College of Science, at (540) 231-5643 or jorzolek@vt.edu. We thank you in advance for your support!