Biological Sciences

VirginiaTech Invent the Future

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In this issue

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

A note from the department head

Welcome to the fall 2016 edition of the Biological Sciences newsletter. It's been another eventful several months for the department, the college, and the university at large. Of particular note is that we welcomed our new dean, **Dr. Sally Morton**, to campus on July 1. She has quickly started to work where **Dean Lay Nam Chang**, the founding dean of the College of Science, left off – her State of the College address at the beginning of November is worth a listen (see www.science.vt.edu)!

Earlier this month Dean Morton also visited with the department's Alumni Advisory Board during their Fall meeting, held at the Price House Nature Center in downtown Blacksburg (see photo below). The Center is the site of numerous outreach activities led by director **Mike Rosenzweig**, including in partnership with research faculty **Lisa Belden**, **Dana Hawley**, and **Brent Opell**. During the Dean's visit Dr. Rosenzweig reminded us of the remarkable history of the Price House, one of the few remaining properties of Blacksburg's original 16 squares:

Photo courtesy courtesy of Assistant Professor of History LaDale Winling. From: http://www.urbanoasis.org/

Did you know? In March of 1872, General Gabriel C. Wharton, who was a member of the Virginia Legislature telegraphed the news of the Morrill Land-Grant Act to establish a college of agriculture and mechanical arts in Blacksburg. The telegraph was sent from Richmond to Christiansburg and relayed to Blacksburg by a messenger on horseback to President of the Preston Olin Institute, Thomas N. Conrad, who resided at the two story log and frame house that now houses our Price House Nature Center. This message, announcing the establishment of the Virginia Mechanical and Agricultural College, arrived as the oil lamps and candles were being lit in the late afternoon.

Read more history related to our department in the pages of this newsletter, including a note about the butterfly collections established by our first department head on page 6. You will also find news about Assistant Professor **Erin Hotchkiss**, who joined us from the University of Quebec in August (p. 11), and the retirement of long-time faculty member and Assistant Dean, **Jerry Via**, whom many of you will surely remember (p. 10). I hope you will enjoy learning about these and many other recent developments, including a glimpse (on pp. 8-9) into what some of our alumni are doing now!

Brenda S.J. Winkel
Department Head and Professor of Biological Sciences

Board photo (L to R): Henry "Buck" Cox, Mike Rosenzweig, John Serabian, Adrienne Hoffman, Jennifer Sheets, Brenda Winkel, Betsy Hagan, Dean Sally Morton, Matthew Latimer, and board chair, Edward Goyette. Not pictured are board members Shawn Semones and Debbie Koller. In the background is another "16 squares" house, 201 Wharton St., built ca. 1871.

Search for common traits of 'survivor cells' could help uncover cancer's Achilles' heel

By Dan Rosplock, Digital Content Specialist, Biocomplexity Institute

Most cells raised in research labs live a pretty pampered life: every aspect of their environment, from temperature to nutrient levels, is carefully controlled to ensure they thrive and multiply.

The cells in Assistant Professor of Biological Sciences **Silke Hauf's** lab won't be quite so spoiled. Based at the Biocomplexity Institute of Virginia Tech, Hauf and a team of international collaborators are working to identify traits that help some organisms continue to function despite extreme variation in their surroundings and internal composition—an effort supported by a new $1.8 million grant from the National Institutes of Health.

If Hauf's specimens have a rougher time than most, it's for a good cause. Finding traits that allow cells to survive stress and internal imbalance could be a major boon to engineers of synthetic organisms. Conditions outside the lab can't be carefully controlled, so a microorganism designed to consume toxic chemicals after an oil spill, for example, needs to be robust enough to endure sudden changes in its surroundings.

Cancer cells, on the other hand, typically seem to prosper under extreme circumstances. Certain mutations help them thrive in low-nutrient, low-oxygen environments, allowing them to overproduce and crowd out healthy cells. If Hauf's team can identify a tipping point where cancer cells' beneficial mutations become self-destructive, scientists could potentially engineer new treatments to give them an extra push over that precipice.

"We're diving into a little-explored area of molecular biology, so this project could take us in a number of exciting directions," said Hauf. "The fantastic thing about this new type of grant is that it gives us the flexibility to adjust our focus and chase down promising leads as they emerge."

This current line of inquiry builds on Hauf's previous work demonstrating that some cellular functions begin to misfire when a precise balance of signaling proteins isn't upheld. Now, backed by simulation technology capable of predicting how specific variables are likely to impact cell survivability, Hauf hopes to hone in on what distinguishes these highly sensitive mechanisms from those that easily accommodate change.

"On the whole, it's unlikely there's going to be one particular protein or a single gene that separates robust and fragile cells," said Hauf. "Experimenting in a simulation environment gives us the freedom to test many assumptions at once and maintain a big picture perspective about how these cellular dynamics function and feed into one another."

Ambitious in its scope, this research initiative has been fully funded through the National Institutes of Health's prestigious Maximizing Investigators' Research Award. Historically this grant has only been available to the most thoroughly established figures in the medical sciences, but the National Institutes of Health recently issued its first-ever call for proposals from early-career researchers. Hauf's project was selected from a highly competitive pool of national candidates to receive this award.

"Dr. Hauf's research brings a remarkable new dimension to the already-powerful programs in cancer and systems cell biology on our campus," said **Brenda Winkel**, Head of Virginia Tech's Department of Biological Sciences. "Moreover, she is a wonderful example of how partnerships between academic departments and the research institutes can help recruit and support faculty who embody Virginia Tech's commitment to providing world-class training for students as they tackle the most urgent problems facing our world today."

To learn more about Dr. Hauf's research, visit http://www.biol.vt.edu/faculty/hauf/

Endangered woodpecker expands home with fungus, Virginia Tech researchers say

By Lindsay Key, Communications Director, Fralin Life Science Institute

Photo by Lori Blanc

Home decor has never been so useful.

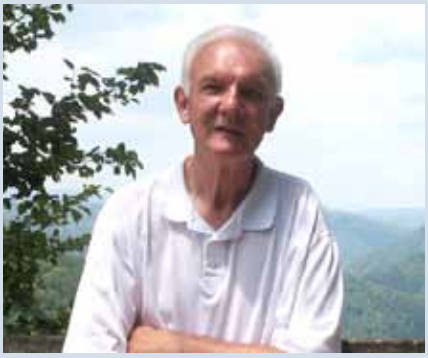
An endangered woodpecker carries wood-eating fungi into its tree cavity home that ultimately help to expand the home's size, according to a multi-institutional team led by a Virginia Tech researcher.

The finding, which comes after more than two years of experimental research in a protected area on Marine Corps Base Camp Lejeune in North Carolina, was recently published in the journal Proceedings of the Royal Society B.

Researchers determined that the red-cockaded woodpecker carries spores from *Porodaedalea pini* and other fungal species on its beak, wings, and feet and introduces them to cavities of trees that are not yet infected, according to senior author J**eff Walters**, the Harold Bailey Professor of Biological Sciences in the College of Science.

Michelle Jusino, lead author on the paper and Walter's former doctoral student, swabbed the beaks, wings, and feet of 11 woodpeckers and sampled 60 tree cavities, half of which were not accessible to the woodpeckers. The holes that were accessible to the birds had the fungi growing in them, while the others did not, indicating that the birds play a role in dispersal.

"Our findings provide the first experimental evidence of a symbiosis between woodpeckers and fungi, two groups of organisms that are often assumed to work together," said Jusino, who is now a research wildlife biologist with the U.S. Forest Service. "The common assumption is that the fungi help the birds, and that very well may be the case as well, but here we have shown that the birds help the fungi. The next step is to show that the fungi found in the excavations actually do help the birds complete the difficult task of excavating a cavity in the heartwood of a living pine tree." *(continued on p.5)*



In Memoriam: Allan Yousten

Allan Yousten, professor emeritus with the Department of Biological Sciences, died Aug. 24. He was 79.

Yousten started his academic career at Virginia Tech in 1971 as a professor of microbiology, focusing his research on the microbiological control of insect pests, particularly the use of *Bacillus thuringiensis* (B.t.) and *B. sphaericus* for mosquito control, a prelude to the university's recent work on controlling mosquitoes as a vector of the Zika virus.

He contributed more than 75 book chapters and research articles, with major funding for his work coming from the U.S. Environmental Protection Agency and the World Health Organization. Before joining Virginia Tech, he worked as a research microbiologist at International Minerals & Chemical Corp. in Illinois and served in the U.S. Army.

In 1980, Yousten received a Fulbright Fellowship for a research assignment at the Pasteur Institute in Paris. He also conducted research as a visiting professor at Arizona State University and at Heriot-Watt University in Edinburgh, Scotland, and had long-term research collaborations with colleagues in Russia and Brazil.

Department of Biological Sciences Head **Brenda Winkel** credits Yousten as having helped lay the foundation for the College of Science's current microbiology degree. "Dr. Yousten's passing leaves a large hole in our department's heart," she said. "In addition to many professional contributions through his research, he provided enormously generous support of students and colleagues at all ranks." *(continued on p. 10)*

New and Renewed Grants

Increased connectivity in a polar desert resulting from climate warming: The McMurdo Dry Valleys LTER Program
(National Science Foundation, $6.7M, 6 year continuance just approved)

PI: Michael Gooseff (University of Colorado); Co-PI's: **Jeb Barrett** (Associate Professor of Biological Sciences), and 10 others

The McMurdo LTER project is one of 26 sites comprising the LTER Network and is conducting long-term ecological research in a broad array of ecosystems. Each site within the LTER Network shares a common commitment to create a legacy of well-designed and well-documented long-term field experiments and observations for use by future generations to improve understanding of basic properties of ecosystems as well as factors causing widespread changes in the world's ecosystem. Sites are also required to synthesize research efforts, such as response to natural and anthropogenic disturbances, and to extrapolate from local scales to continental and global scales. The McMurdo Dry Valleys are located on the western coast of McMurdo Sound (77°00'S 162°52'E) and form the largest relatively ice-free area (approximately 4800 square kilometers) on the Antarctic continent. These ice-free areas of Antarctica display a sharp contrast to most other ecosystems in the world, which exist under far more moderate environmental conditions.

Jeb Barrett

CryoEm data collection facility consortium at the National Center for Macromolecular Imaging (NCMI)
(National Institutes of Health/National Institute of General Medical Studies, $1M, 5 years)

PI: Wah Chiu (Baylor College of Medicine); Co-PI's: **Deborah Kelly** (Assistant Professor of Biological Sciences/VTCRI), and 7 others

The Baylor College of Medicine offering to provide a portion of the time on their JEM3200FSC and JEM2200FS electron microscopes for a cryo-electron microscopy (cryoEM) and tomography (cryoET) data acquisition consortium of 11 academic institutions around the USA. Both instruments are equipped with a field emission gun and an in-column energy filter, while the JEM2200FS also has a Zernike phase plate attachment. Both instruments will be equipped with existing or new direct electron detectors. These microscopes will be used for high resolution data collection on biological specimens, including macromolecules, molecular machines, and cells at state-of-the-art resolution.

The Southeastern Consortium for Microscopy of Macromolecular Machines (SECM4)
(National Institutes of Health/National Institue of General Medical Studies, $922K, 5 years)

PI: Kenneth Allen Taylor (Florida State University); Co-PI's: **Deborah Kelly** (Assistant Professor of Biological Sciences/VTCRI), and 10 others

Deb Kelly

The Southeastern Consortium for Microscopy of MacroMolecular Machines (SECM4) comprises 15 medical centers and uiniversities using high-resolution cryogenic electron microscopy to study critical biomedical projects. Consortium members research disease pathogens including viruses such as HIV, polio, adenovirus, papilloma virus, and measles virus; bacterial pathogens such *Vibrio cholera*, *Salmonella typhimurium*, and *Shigella* sp., which cause dysentery. Others study proteins such as BRCA1, a causative agent of breast cancer and large enzymes such as Complex I, defects in which are linked to Parkinson's disease, to name a few.

Collaborative Research: Identifying and modeling the advantages of regulating protein abundance in *Caulobacter crescentus*
(National Science Foundation, ~$980K, 3 years)

PI: Yang Cao (VT CS); Co-PI: **John Tyson** (University Distiguished Professor of Biological Sciences)

The cell cycle is a series of cellular events leading to DNA duplication and cell division, and ultimately to the production of two daughter cells. This project will address broadly relevant questions about cell cycle regulation. Namely, what is the function of the regulated degradation of crucial cell cycle proteins and how does this regulatory mechanism integrate with other levels of regulation to control the cell cycle? By addressing these questions, this work has the potential to have a significant impact on our basic understanding of how the cell cycle is regulated. This project will expose students to interdisciplinary research and allow undergraduate students in summer laboratory courses to be active participants in research.

Optimizing targeted breast cancer therapy by mathematical modeling and experimental studies
(National Institutes of Health, ~$2M, 5 years)

PI: William Baumann (VT ECE); Co-PI's: **John Tyson** (University Distiguished Professor of Biological Sciences), and 1 other

Cancer therapies that target specific proteins or reactions within cancer cells have a great advantage over untargeted chemotherapy in terms of reduced side effects. But long-term use of targeted therapies can often result in the remaining cancer cells becoming resistant to the therapy. The researchers will use experimentally-derived mathematical models to optimize the sequencing and timing of multiple targeted therapies so as to maximize the killing of cancer cells while reducing toxicity to normal cells and avoiding the onset of resistance.

John Tyson

Endangered woodpecker (continued from p. 3)

Walters, who has studied the red-cockaded woodpecker for almost 40 years, said these longleaf pine cavities are extremely important to the bird's survival. As cooperative breeders, many woodpeckers live at home with their parents until they are able to acquire their own cavities. Building a new cavity is a process that can take as long as 13 years.

"In order to create their homes in the preferred longleaf pine, these birds must dig a tunnel through the outer surface of sap wood, and the tree responds by releasing sap that could trap and kill the bird if it is not careful," said Walters, who is also affiliated with the Global Change Center at Virginia Tech and the Fralin Life Science Institute. "Once the bird gets through this layer, it reaches heartwood which is a bit less risky but still takes years to excavate." The wood-eating fungus appears to speed up the process.

Creating one's own home is desirable because only home-owning birds have a chance to breed. Only two birds (one female and one male) breed per family, and this ranking is based on seniority.

The red-cockaded woodpecker is the only woodpecker that chooses to make its home in the trunks of living pine trees, and the reason for this preference is still a mystery to scientists. To accommodate the birds, the trees must be at least 100 years old and relatively healthy —when a tree dies, it is abandoned as a nest site.

The highly specific habitat preference does not bode well for the bird's endangered status, but in past years Walters and his group, with help from a National Science Foundation grant and funding from the Department of Defense, have assisted by drilling holes in the trees, creating hundreds of new cavities and attracting 83 new family groups to the Camp Lejeune area. This management project was repeated with populations in the Sandhills of North Carolina and Eglin Air Force Base in Florida, and their successes led the U.S. Fish and Wildlife Service to declare these two populations recovered.

With a little help from their friends — both fungi and humans — these quirky birds have a better chance of survival as a species.

Professor Smyth's Butterflies

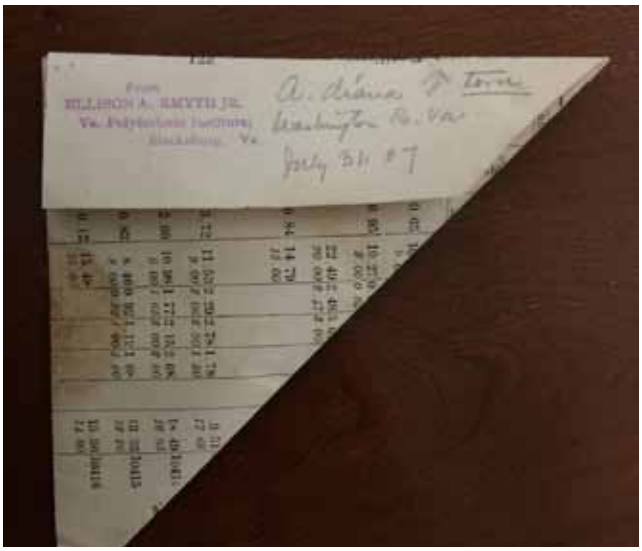
By Paul Marek, Assistant Professor of Entomology

Did you know that the first football coach at Virginia Tech, Professor **Ellison Smyth** *(pictured right)*, was also a butterfly collector? In fact, Professor Smyth was also one of the first instructors in biology, and later the first dean of the faculty at Virginia Tech (1902-06).

Professor Smyth grew up in Charleston, South Carolina, where as a boy enjoyed being outdoors collecting butterflies and birds. As a 10 year old, he amassed a collection of birds, butterflies and other insects. The collector's bug (so to speak) had already taken hold, and he was hooked on natural history. After completing an undergraduate degree, he enrolled in law school at the University of Virginia. Smyth was hired as a clerk at a law firm in Charleston, South Carolina, and later as a partner. However, he admitted that pursuing law was only to satisfy his folks and later quit the firm to pursue biology completely. The lifelong love of biology and natural history was too strong to ignore! Smyth was hired as an adjunct professor at the University of South Carolina and then a professor of biology at Virginia Tech where he taught until 1925. (From the UNC Herbarium, which holds some plant specimens collected by Smyth in the late 1800s.)

I recently found some of Professor Smyth's butterfly specimens stuffed away in an old drawer in the Virginia Tech Insect Collection. These are commonly known as "papered" specimens. Within each folded paper triangle is a single butterfly or other large winged insect (e.g., dragonfly or katydid) that was placed directly into the paper once collected. The paper helps keep the wings in good shape for pinning and spreading the specimen later on. Because many of the triangles were made from newspapers, there are some classic old-timey ads on some of them!

I've peeked in a few of the paper envelopes and there are some spectacular butterflies that await preparation. While mostly local Appalachian species, for example the rare Diana fritillary (bottom left and below), there are a number of exotic butterflies that Smyth collected in Africa and traded with colleagues. I am now carefully pinning and spreading Professor Smyth's collection, and will share the discoveries that I find in a following post *(on the Virginia Tech Insect Collection Blog, http://collection.ento.vt.edu.)*



Family of late professor David A. West introduces his book

By Lindsay Key, Communications Director, Fralin Life Science Institute

The book "Darwin's Man in Brazil: The Evolving Science of Fritz Müller," by **David A. West**, associate professor emeritus of biology (1962-1998) was published by the University Press of Florida in July 2016.

The book was introduced to the Virginia Tech community on Sept. 30 in the Fralin Life Science Institute auditorium and atrium. The book launch included a panel discussion which highlighted the book and West's story of how he wove together his research and global travels to produce a thorough explanation of Müller's life and scientific findings. A reception followed, with book sales and signing by members of the panel. Photos from the event are included below.

At the time of his death in April 2015, David West's dream was coming true – the publication of his long-time work on evolutionary biologist and theoretician Fritz Müller (1821–1897). Müller belongs to the cohort of great 19th-century naturalists. West describes the close intellectual kinship between Müller and Darwin and details a lively correspondence that spanned 17 years. Despite the importance and scope of his work, however, Müller is known for relatively few of his discoveries. West remedies this oversight, chronicling the life and work of this extraordinary and overlooked man of science.

According to Virginia Tech Professor Emeritus of Biology **Duncan M. Porter**, the former senior editor and director of the Darwin Correspondence Project, "Fritz Müller's importance to Charles Darwin was demonstrated by his son Francis: 'My father's correspondence with Fritz Müller was, in its bearing on his work, second in importance only to that with [Joseph] Hooker. He had for Müller a stronger personal regard than that which bound him to his other unseen friends.' Darwin turned many of Fritz's fact-filled letters to him into publications. David West was certainly correct when he wrote 'Fritz Müller was Darwin's closest intellectual kin.'"

West's remarkable book goes beyond revealing the importance of Müller's contributions to the development of evolutionary theory, casting new light on the social and environmental impacts of colonialism in the late 19th century. According to the book's foreword, written by Virginia Tech Professor Emeritus of Philosophy and Science Studies Richard Burian, and University of Florida history of science professor, Vasiliki Betty Smocovitis, "Here, West enables us to understand the intersection of human migration, settlement, and environmental change with exploitative practices, such as slavery in the rapidly shifting economy of post-colonial Brazil."

If you are interested in ordering a copy of David West's "Darwin's Man in Brazil", visit the University Press of Florida website: http://www.upf.com/book.asp?id=WESTX007.

L to R: Lindsay West (wife of David West), Duncan Porter (Professor Emeritus of BIOL, VT), J. James Murray (Professor Emeritus of BIOL, UVA), Susan West Marmagas (Assistant Professor of Practice and Interim Program Director of Public Health, VT, and daughter of David West), and Richard Burian (Professor Emeritus of Philosophy & Science, VT)

Alumni Spotlights

Emma Chotner Van Hook is a Director of Policy & Research at the Pharmaceutical Research and Manufacturers of America (PhRMA), the trade association representing the leading innovative biopharmaceutical companies. Her degree from Virginia Tech (B.S. in Biological Sciences, minor in Chemistry, '07) laid the foundation for her focus on the science as it impacts, or is impacted by, public policy, including the value of medicines, the R&D process, and personalized medicine. Before joining the Policy team at PhRMA, Ms. Van Hook worked abroad as a research associate at the Gertner Institute for Epidemiology and Health Policy Research in Tel Hashomer, Israel and in regulatory affairs at a mid-size biotech company, as part of the clinical development teams for a novel anthrax anti-toxin as well as a first-in-class lupus treatment. She received her M.S. from Georgetown University (Biotechnology, '08).

Alicain Carlson received her B.S. in Biological Sciences from Virginia Tech in 2008; while completing her degree, she worked as an undergraduate researcher in Don Cherry's lab. She worked for several years in the floral industry, then went on to receive her Ph.D. in Horticultural Science from NC State in 2014. Dr. Carlson currently works as a Technical Scientist for Sygenta Flowers in Gilroy, CA. According to the company website, "Syngenta Flowers, Home and Garden is one of the largest wholesale breeders of hybrid flower seed in the world – developing and producing flower seeds for seed companies and growers internationally."

Katrina Mueller is a Fisheries Outreach Coordinator with the U.S. Fish and Wildlife Service based in Anchorage, Alaska. In addition to the fisheries program, Ms. Mueller also does outreach for the USFWS Conservation Assistance Programs, including Partners for Fish and Wildlife; and Fish Passage, Coastal, and National Fish Habitat Partnership. She received B.S. degrees in Biology and Psychology from Virginia Tech in 2002, and went on to earn a Ph.D. in Fisheries and Wildlife from Michigan State University in 2011.

Lewis Lanier received a B.S. in Biology (Microbiology) from Virginia Tech in 1975, and went on to earn a Ph.D. in Microbiology and Immunology from UNC-Chapel Hill in 1978. He is currently the J. Michael Bishop Distinguished Professor and Department Chair of Microbiology and Immunology at the University of California San Francisco, and serves as Director of both the George Williams Hooper Research Foundation at USCF and the new Parker Institute for Cancer Immunotherapy at USCF. From the linked article, Lanier "is an expert in 'natural killer cells,' which he describes as the 'Marine Corps' of the immune system because they are often the first into battle." Dr. Lanier recently send us a nice note, saying, "I got excited about immunology after taking the first immunology course offered at Tech, taught by **Klaus Elgert** when he was a first year Assistant Professor in the Biology department. Inspired me to go to grad school in immunology and the rest is history…"

Anton Dawson graduated from Virginia Tech in 2008 with a B.S. in Biological Sciences and a B.A. in Chemistry. During his time at VT, he worked as an undergraduate researcher in **Daniela Cimini's** lab. He went on to receive a Ph.D. in Pharmacology and Toxicology from Virginia Commonwealth University in 2012. He is currently a Technology Transfer Liaison for the Henry M. Jackson Foundation for the Advancement of Military Medicine (HJF), in Bethesda, MD. HJF is "a global organization dedicated to advancing military medical research. We serve military, medical, academic and government clients by administering, managing and supporting preeminent scientific programs that benefit members of the armed forces and civilians alike." As a Technology Transfer Liaison, Dr. Dawson helps to facilitate collaboration between scientists and private industry on research and development projects, with the goal of making innovative medical technologies available for clinical use.

Mark Grippo received his M.S. in Biological Sciences in 2001, under advisor **Alan Heath**. He completed a Ph.D. in Ecology from Louisiana State University in 2009, and he is now an Ecologist in the Ecological Science & Environmental Risk Department at Argonne National Laboratory in Illinois. In his current position, he works with ecological resources and systems, with responsibility for evaluating the ecological impacts of energy projects and conducting ecological risk assessments. Among his career highlights, he lists investigating offshore food webs in the Gulf of Mexico, and evaluating the impacts of solar of solar energy developments and the potential for invasive species transfer through the Chicago Area Waterway System.

Tanya Palmateer Oxenberg received her B.S. in Biology (with a Health Physics Option) and French in 1978. She went on to receive an M.S. in Health Physics from Georgia Tech and an M.S. in Environmental Engineering and Science from Johns Hopkins. She is currently a Reactor Systems Engineer with the U.S. Nuclear Regulatory Commission in Rockville, MD, and also serves as President of the Baltimore-Washington Chapter of the Health Physics Society.

Christena Linn Cadieux received her M.S. in Biological Sciences from Virginia Tech in 2008, under advisor **Zhaomin Yang**. She recently sent this update and nice note to Dr. Yang: "I know that it has been quite some time since I was a member of your lab (almost a decade) but I thought you might like to know that I recently completed my doctoral work and graduated from the University of Delaware with a Ph.D. in biochemistry. Your mentorship at the beginning of my scientific career proved to be invaluable. I can't overstate how your attention to the details of experimental design and your meticulous writing style have influenced me."

Leslie Weldon (B.S., Biology, '83) is the deputy chief of the national Forest System, overseeing 155 national forests and 20 grasslands totaling 193 million acres, a position she has held since 2012. Previously she was the regional forester in Montana, where she oversaw 15 national forests and 4 national grasslands within the states of Montana, Idaho and North Dakota. Weldon began her career as a summer hire on the Mount Baker-Snoqualmie National Forest in Washington fighting fire and surveying wildlife. Since then she held biologist positions on the Mount Baker-Snoqualmie, at the National Headquarters, and in the Northern Regional Office. She also served as Stevensville District Ranger on the Bitterroot National Forest, as Liaison to the U.S. Army and as Executive Policy Assistant to former Forest Service Chief Michael Dombeck. Weldon was Forest Supervisor on the Deschutes National Forest from 2000 - 2007.

Daniel Shickel received his B.S. in Biological Sciences in 2009. During his time at Virginia Tech, he conducted undergraduate research in Birgit Scharf's lab. After graduation, Daniel worked as a microbiologist at TechLab in Blacksburg, VA, and then as a biochemist at Merck in Elkton, VA, before deciding to go back to school for a career change. In 2014, Daniel graduated from Eastern Mennonite University with an MBA in Health Services Administration so he could pursue his passion of working in the field of healthcare, particularly with the elderly population. He currently serves as the Admissions Manager for a Continuing Care Retirement Community in Harrisonburg, VA. Daniel's vocation allows him to work closely with both residents and their families as they transition through skilled-rehabilitation services. As any true Hokie would, Daniel still makes frequent visits back to Blacksburg to cheer on the Hokies from the football stands.

We love hearing from our alumni! Drop a note to vsutherl@vt.edu to let us know about your time at Virginia Tech, and about what you're doing now!

Jerry Via, Assistant Dean of Undergraduate Instruction in the Virginia Tech College of Science and an Instructor in the Department of Biological Sciences, retired earlier this month after 37 years of teaching, mentoring, and making students laugh. More than 20,000 students have taken Via's Introduction to Biology class since he joined Virginia Tech in 1979. His class not only catered to undergraduates from the College of Science, but students from across the university. He joined the dean's staff as assistant dean for undergraduate instruction in 1989, starting with the College of Arts and Science and its split through to the current College of Science, formed in 2003.

"Jerry Via exemplifies the guiding ethos of Virginia Tech -- 'That I May Serve,'" said Wanda Hankins Dean, vice provost for enrollment and degree management. "He is that 'go-to' person who will always be willing to talk to a group, a family, or a student about the value of a Virginia Tech education. Through his teaching, his outreach, and his mentoring of students, Jerry demonstrates an overabundance of extending grace and caring to all with whom he interacts. I congratulate him on his retirement."

In class, Via would dress up as any assortment of characters every Halloween, most recently as Hagrid, the gentle gamekeeper human/giant from the Harry Potter book and film series. The costume was more than appropriate. Via holds a doctoral degree in zoology from Virginia Tech, and his research focuses on the ecology and natural history of birds. He also serves as president of the New River Valley Bird Club.

Via is known for his sense of humor. He regularly carted around fake skeletons around campus, leaving them on benches with cardboard messages of good cheer, or bringing them to class, or using them as décor in the College of Science administration offices at Halloween.

Via said he will volunteer with bird-related projects, as well as Good Samaritan Hospice. "I hope to have the time to finish many of my projects inside and outside of the house," he said. "Finally I will remain on call for any needs of my College of Science family."

In Memoriam: Allan Yousten *(continued from p.3)*

Yousten, who retired in 2001, was a member of the Department of Biological Science's OWLS — Older Wiser Learned Scientists — a group of Biological Sciences emeritus faculty members who meet monthly to hear presentations on research by current faculty.

"The OWLS will miss Al's love of science and his sense of humor," said Robert Benoit, emeritus professor of Biological Sciences. "Al was a first-class bench scientist, and learning how to keep a mosquito colony in the lab is not a task for the faint of heart. When Al's graduate students had to use dangerous chemicals in their research, such as mutagenic agents, he insisted on doing those phases of the research himself. He never lost his love for laboratory and field experimentation at any phase of his professional development."

R. Martin Loop is a professor of microbiology and immunology at East Carolina University in Greenville, North Carolina. A student at Virginia Tech during the late 1970s, Loop took Yousten's general microbiology course as part of a biology requirement for veterinary school. The class changed his career path.

"I had the good fortune of having Al Yousten as the instructor for that course. Within the first few weeks after starting the course, I became fascinated by the prokaryotes and decided to redirect the focus of my education toward graduate study in bacteriology," said Loop. "Almost 40 years later, I can truly say that I have never regretted that decision, and have been fortunate to have had a relatively successful career in the field. Al Yousten was a great teacher, and his passion for the prokaryotic world was infectious. I owe him a huge debt of gratitude for opening up a career opportunity that turned out to be a labor of love."

Yousten earned his bachelor of science degree in bacteriology from the University of Wisconsin, and his master's and doctoral degrees in microbiology from Cornell University.

Awards and Announcements

Assistant Professor **Erin Hotchkiss** is the newest faculty member in Biological Sciences. She earned her B.S. in environmental studies at Emory University in 2003, an M.S. in zoology and physiology from University of Wyoming in 2007, and a Ph.D. in ecology, also from the University of Wyoming in 2013. She then served as a postdoctoral research fellow at Umeå University in Sweden and the University of Quebec in Montreal in Canada.

A freshwater ecologist, Dr. Hotchkiss works primarily in streams and rivers, focusing her research on empirical data and statistical models in order to link biological and physical processes with carbon and nutrient sources, cycling, and fate.

She recently received the Raymond L. Lindeman Award from the Association for the Sciences of Limnology and Oceanography (ASLO). This award honors a scientist of 35 years of age or less for an outstanding peer-reviewed, English-language paper in the aquatic sciences. Dr. Hotchkiss was also honored with the 2016 Hynes Award for New Investigators from the Society for Freshwater Science (SFS). Welcome, and congratulations, Dr. Hotchkiss!

Ellen Garcia, a graduate student in **Daniela Cimini's** lab, received a "Tox21" Award at the Fifth Annual Meeting of the American Society for Cellular and Computational Toxicology. Her talk was entitled, "Single-cell analysis reveals that silver nanoparticle exposure leads to multi-nucleation through defective cell division." She also won the Best Poster Award, for a poster with the same title, at the Biocomplexity Institute Research Symposium.

Amina Rahimi, an undergraduate researcher in **Caroline Jones's** lab, was one of 14 students awarded a new Fralin Undergraduate Research Fellowship this fall. The goal of the award program is to increase diversity in research by including students from underrepresented groups. Each Fellow receives $1,000 to conduct research with a VT faculty member over the course of one academic year.

Jennifer Smith, a research scientist in **Jeff Walters's** lab, is coauthor on an article that was recognized with the 2016 Wildlife Society's Research Paper Award. The paper is entitled, "Factors affecting female space use in 10 populations of prairie chickens."

Sieu Tran, a double major in microbiology and mathematics, was named a 2016 Goldwater Scholar. In 2016, the Goldwater Foundation received 1,150 nominations for the prestigious award. Tran is one of 252 selected for the scholarship.

Wen Xiong, a Ph.D. student in **Daniel Capelluto's** lab, won the Best Student Oral Presentation Award for the Structural Biology, Biochemistry, and Biophysics section of the 2016 Virginia Academy of Science Annual Meeting. His presentation was entitled, "Structural basis of ligand recognition by the endosomal adaptor protein Tom1."

Matt Aberle, a graduate student in **Dana Hawley's** lab, received a $2,500 research award from the American Ornithologists' Union. Matt's research is entitled, "Effects of temperature on house finch behavior, physiology, and infectious disease transmission." Congratulations, Matt!

Angie Estrada, a Ph.D. student in **Lisa Belden's** lab and an IGC Fellow, was awarded the SENACYT-IFARHU 2016 Doctoral Fellowship. She will receive three years of support to continue her graduate education. SENACYT (National Secretariat of Science, Technology and Innovation) is Panama's government authority in charge of planning and implementing the national strategy of science and technology. It is the equivalent of the NSF in the United States. SENACYT supports outstanding Panamanian students who are pursuing undergraduate, graduate and post-graduate degrees in fields of science at internationally recognized institutions. Angie's dissertation focuses on seasonal variation of disease and skin bacterial communities in tropical lowland amphibians. Her main interest is advancing the application of scientific research into a holistic conservation research program for amphibians in Panama. Congratulations, Angie!

Ryan McClure, a graduate student in **Cayelan Carey's** lab, has received the Leo Bourassa Award from the Virginia Lakes and Watershed Association for his research on the effects of water quality management on water quality and greenhouse gas production in Virginia reservoirs. This award was chosen based on his contributions to the field of water resources in the Commonwealth of Virginia and goes to the top graduate student doing water research in Virginia. Ryan has been monitoring the water quality of several reservoirs in southwestern Virginia during the past year, and works in close collaboration with the Western Virginia Water Authority in Roanoke. The data he collects from the reservoirs are used to help inform management decisions for the drinking water of Roanoke. Congratulations, Ryan!

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Department of Biological Sciences Annual Fund

Above: Professor Ann Stevens engages the students in her Microbial Physiology in conducting the Volta Experiment in the VT Duck Pond

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 one of the largest degree-granting programs at Virginia Tech, with more than 900 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, with students working with our outstanding faculty members to 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 fund raising 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!