

Undergraduate Research Awards

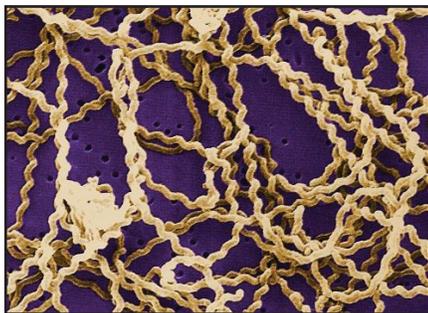
Did you know that our department gives several undergraduate research awards each year? These awards are supported by special funds established by former students and faculty from our department. The first of these was instituted by **Stacey Smith**, a 1999 alum who is now an Assistant Professor at the University of Nebraska. You may recall reading about her in the Winter 2012 issue of this newsletter. Dr. Smith established this award to provide opportunities similar to the ones that spurred her interest in a scientific research career. Two more awards have since been established in the same vein.*

The research funded by these awards has been carried out in labs across the university and even at sites around the world. This past year, the **Stacey Smith Undergraduate Research Excellence Award** was given to **Ashley Love** in **Dana Hawley's** laboratory to study infection of a North American backyard songbird, the house finch (*Carpodacus mexicanus*), by the bacterium, *Mycoplasma gallisepticum*, which causes blindness and is sometimes fatal. Ashley had previously shown that *Mycoplasma* infection is associated with elevated levels of the stress hormone, corticosterone, in these birds. The Stacey Smith award allowed her to establish an assay for cytokines, which had not previously been available for house finches, so that she could begin to track the immune response and examine endocrine-immune interactions that occur during the infection process. Ashley has just been accepted into the Ph.D. program at the University of Georgia, in no small part thanks to this wonderful research experience!



House finch (*Carpodacus mexicanus*)
Photo courtesy of Dana Hawley

The **Robert Jones Undergraduate Research Excellence Award**, supported by our former department head (now Dean of the Eberly College of Arts and Sciences at the University of West Virginia), was last year given to **Melinda Opgrand**. Melinda worked with **Jeb Barrett's** research group studying the influence of environmental factors on the distribution of the spirochaete bacterium that causes Leptospirosis. This is one of the most common diseases transmitted from animals to people, typically through contact with water contaminated with animal urine. Melinda's study examined the abundance of *Leptospira interrogans* in soils and adjacent aquatic environments in Southwestern Virginia, including agricultural landscapes, municipal parks and wetlands, and a forested head-water catchment in the Jefferson National forest. This work generated the first report of land-use, geochemical, and hydrological influences on the occurrence and distribution of this pathogen in soil and surface water environments of Southwestern Virginia.



Leptospira interrogans
Photo credit NCBI / CDC

This year we have added a third award, the **Biological Sciences Alumni Undergraduate Research Excellence Award**, supported by discretionary funds contributed by former students, faculty, and other donors.

The recipients of the three awards for spring 2013 have just been announced. They will go to **Jenna Sackenheim** in **Khidir Hilu's** Lab (Stacey Smith Biology Research Excellence Award); **Spencer Cesar** in **David Popham's** Lab (Robert Jones Undergraduate Research Excellence Award), and **Albert Hinman** in **Daniela Cimini's** Lab (Biological Sciences Undergraduate Research Excellence Award).

Speaking of giving back to the department, you will find in this issue the third and final installment of the history of the department assembled by Emeritus Professor **Bruce Parker**. Dr. Parker has been a long-time supporter of the department, also continuing to give generously of his time as leader of the OWLS (Older Wiser Leaders of Science), our emeritus faculty group that meets monthly to hear a research report from one of our current faculty and enjoy lunch. More about the OWLS in an upcoming issue!

We hope that you enjoy reading about the department's activities, past and present, including the addition this year of numerous new faculty and staff members. Searches are underway to add another several faculty this year, including at the Virginia Tech Carilion Research Institute in Roanoke – the department is definitely on the move! -- **Brenda S.J. Winkel, Department Head**

*Recipients are selected by a committee of current faculty and students based on a brief (one-page) description of the proposed work and a letter of support from the sponsoring faculty member. Any student majoring in Biological Sciences with an in-major QCA of 3.0 and at least one previous semester of undergraduate research experience may apply; the Stacey Smith Award is specifically directed at members of groups that are under-represented in the sciences. At the end of the award period, the recipient submits a short report of the outcomes of their work to the department.

Meet our newest department members!



Michael Fox is an Associate Professor of Biological Sciences and a member of the Virginia Tech Carilion Research Institute. He earned his Ph.D. in the Department of Anatomy at Virginia Commonwealth University then pursued postdoctoral research in the Department of Molecular and Cell Biology at Harvard. His most recent position was as an Assistant Professor in the Department of Anatomy and Neurobiology at the Virginia Commonwealth University Medical Campus. Dr. Fox's research focuses on CNS synapse formation, which is essential in understanding of neurological disorders.



Eric Hogan joined our department as an Instructor of Biological Sciences in Fall 2012. He earned his Ph.D. in the Virginia Tech Department of Plant Pathology, and went on to teach Biology and Chemistry at Pulaski County High School in Dublin, VA. His most recent position was as an Instructor of Biology and Environmental Sciences for the Southwest Virginia Governor's School for Science, Math and Technology in conjunction with New River Valley Community College, which offers dual-enrollment courses for select high school seniors in Southwest Virginia. Dr. Hogan has taken on a number of high-impact courses for the department, including two sections of Principles of Biology this spring, each with more than 250 students!



Joel McGlothlin, Assistant Professor of Biological Sciences, joined our department in Fall 2012. He earned his Ph.D. in Evolution, Ecology, and Behavior from Indiana University and went on to conduct research as a Postdoctoral Associate and a Research Scientist in the Biology Department at the University of Virginia. Dr. McGlothlin's research focuses on the evolution of complex phenotypes; particularly the evolution of phenotypic integration which explains how natural selection shapes groups of traits to produce well-adapted organisms.



Kendra Sewall joined our department as an Assistant Professor of Biological Sciences in January 2013. She received her Ph.D. in Animal Behavior from the University of California, Davis, and then pursued a SPIRE Postdoctoral Fellowship at UNC-Chapel Hill and an NRSA Postdoctoral Fellowship at Duke University. Dr. Sewall's research seeks to understand how neural and behavioral processes - and the environmental and developmental factors that impact those processes - contribute to animals' survival and reproductive success.



Michael Strickland joined our department as an Assistant Professor of Biological Sciences in Fall 2012. He received his Ph.D. in Ecology from the University of Georgia, then conducted postdoctoral research in Terrestrial Ecosystem Ecology at Yale University. His research seeks to understand the interrelationship between microbial communities and ecosystem processes; specifically, how changes within the microbial community (e.g. composition, physiology, and population/community level interactions) affect and are in turn influenced by ecosystem processes (e.g. litter decomposition, carbon sequestration).



Gregorio Valdez is an Assistant Professor of Biological Sciences and a member of the Virginia Tech Carilion Research Institute. He received his Ph.D. in Neurobiology and Behavior from Stony Brook University, and his most recent position was as a Senior Postdoctoral Fellow in the Department of Molecular and Cell Biology at Harvard University. Dr. Valdez's research is aimed toward discovering molecules that protect synapses from the ravages of aging and age-related neurological diseases.



Joshua Akers, Senior Computer Support Specialist for the Department of Biological Sciences, joined us in October 2012. He received a B.S. in Computer Science from Eastern Mennonite University, and his most recent position was as an IT Specialist at Radford University. Josh is staying busy managing our servers, instituting software and hardware upgrades, and responding to emergency calls across four different buildings on the Blacksburg campus and the CRC. We sure are glad to have Josh with us!



Kimberly Hodge, Fiscal Technician for the Department of Biological Sciences, joined us in May 2012. Her background includes accounting experience at the VT Foundation and Intrexon, and she holds an A.A. degree in Accounting. Kim has taken on a variety of responsibilities in the Business Office, serving as the main point person for the research operations of some 15 faculty, among other tasks. We're not sure how we managed without her!



Emily Overend joined us in July 2012 as a Receptionist for the Department of Biological Sciences. She earned a M.A. in Spanish Language and Literature from Middlebury College, and her background includes teaching Spanish in grades 6-12 and an Adjunct appointment at the University of Connecticut. Emily is the first point of contact for visitors to the Business Office, while also providing expert assistance with everything from tracking incoming orders to helping with visitors' travel arrangements. She's a great asset for the department.

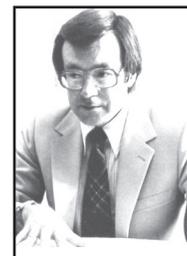
The History of Biological Sciences Part III: Looking Toward the Future

by Professor Emeritus Bruce Parker (Continued from our Spring 2012 Newsletter)

When **Robert Paterson**, Head of the Biology Department, moved on to other administrative positions in 1979, **George Simmons** became interim head, while a new search took place. Simmons helped sustain the momentum in scholarly pursuits. During his term as interim head, **Muriel Lederman** joined the faculty as the new virologist.

The Stout & Cowles Administrations

As external candidates did not satisfy the requirements of the department, the search committee looked within its ranks and asked **Ernest Stout** to be the new head in 1980. The period of rapid growth under Paterson had ended. Campus enrollment had doubled to about 20,000, of which an increasing number were women with about equal numbers of male and female students in the Biology Department. Stout proved himself an able administrator capable of upholding high standards of our faculty and graduate students in research, teaching and grantsmanship. [This term refers to skills for writing grant proposals for outside funding of research, graduate and post-doctoral students, travel to meetings, etc.] Stout also introduced new ideas. He led the department through the difficult transition from the quarter to the semester system. He hired **Khidir Hilu, Prakash Nagarkatti, Erik Nilsen, and Bruce Wallace**, mostly to fill vacant positions. Under Stout's leadership, the department established its first endowed chair - **The Harold H. Bailey Professorship in Vertebrate Biology**, first occupied by **James Carr**. Then in 1988, Stout left to become acting head of the Research Division, later Associate Provost for Research. Again, George Simmons assumed the role of interim head. The search took two years.



Dr. Ernest Stout



Dr. George Simmons

In 1990, **Joseph R. Cowles** became head. He had prior administrative experience at the University of Houston, essential for running a large, increasingly complex and diverse department with numerous undergraduates, graduate students, and post-doctoral fellows on the rise. Cowles convinced the faculty that a second area of molecular biology added to the existing depth in aquatic and terrestrial ecology would be a healthy new direction. Cowles made many contributions. He established the first successful Biology Seminar, which combined botany, microbiology, and zoology. Subsequently, to ensure diversity, separate seminars in Ecology & Evolution and Molecular & Cell Biology were developed. The faculty meetings and the once per semester informal gatherings at the Cowles' home encouraged interaction and cohesiveness: always communicating, exchanging ideas, listening to one another. Thus, the strong leadership continued. With Cowles at the helm, a higher level of excellence was achieved in research, teaching, and grantsmanship.

In 1990, three graduate students (**Michael Rosenzweig, Robert Atkinson, and Jennifer Tank**) established a Biology Association of Graduate Students (BAGS) in response to the increasing number of advanced degree students in the department and the opportunity to organize an "official voice" of the graduate students. About 1997, BAGS name was changed to the Biology Graduate Student Association (BGSA). BGSA hosted departmental socials, a fall and spring annual picnic, occasional banquets, and an annual graduate research symposium. T-shirt sales and other functions did much to give BGSA income and recognition.



Dr. Joseph Cowles

During the 1990s, biology faculty and students began receiving more on-campus and off-campus awards. **John Cairns** was elected to the National Academy of Sciences in 1991, and Joe Cowles pointed out at a reception honoring John, that Virginia Tech had only a few members of the Academy, two of whom were in our Biology Department (Bruce Wallace & John Cairns). During Cowles' 12 years as head, he added **Lynn Adler, Cynthia Gibas, Robert Jones, Stephen Melville, John Phillips, David Popham, Jill Sible, Ann Stevens, Maury Valett, Richard Walker, Jeffrey Walters** (Bailey Chair), **Brenda Winkel** and **Edward Wojcik** - many of these to replace retired faculty. He also convened the first Alumni Advisory Board in 2001, making new connections between eminent alumni and the department. This group meets twice each year and has fostered new financial investments in the department, while bringing important new perspectives and advice from accomplished businesspeople, physicians, teachers, and even a member of the CIA to bear on the department's various challenges.

So, under the able leadership of Paterson, Stout, Cowles and significant "pinch hitting" by Simmons, the Biology Department had improved steadily, despite setbacks--usually financial (budget cuts) during periods of recession. Almost imperceptible at first, the large group of faculty hired by Paterson had been advancing in years. Cowles perceived the problem of multiple retirements and possible losses of positions that began with **Rhodes B. Holliman** in 1991, Robert Paterson and Bruce Wallace in 1994, John Cairns in 1995, **Harrison Steeves** and Ernest Stout in 1997, **Noel Krieg, David Stetler** and **David West** in 1998, **Alan Heath** in 2000, **Curtis Adkisson, Robert Benoit** and **Allan Yousten** in 2001, **William Claus, Albert Hendricks, Orson Miller** and **Bruce Parker** in 2002, George Simmons in 2003. Cowles tried to save as many positions as possible for new hires. However, by 2002 the full-time tenure track faculty had dropped to 35, significantly below the all-time high of 49 in the Paterson era.

The Jones & Winkel Administrations

In response to Cowles's intention to step down as head in 2002, the search for a new leader began. This led to the appointment in 2002 of **Robert H. Jones** who was already a faculty member. Cowles and Jones worked in concert for about six months. This transition went smoothly, and Jones was well-prepared to head the Biology Department by August 2002.

Zhaomin Yang joined Biology in 2002, and Jones facilitated the hiring of **Iuliana Lazar** and **Christopher Lawrence** through affiliation with the Virginia Bioinformatics Institute (VBI) in 2003, followed by **Lisa Belden** and **Ignacio Moore** in 2004. Good things continued to happen in Biology. Several scholarship funds begun by Cowles continued to grow toward their ultimate activation with Jones' encouragement. Biology also acquired new space in Derring Hall, much of which became available when the Department of Psychology moved to Williams Hall, and the new adjacent Hahn Hall-North Wing. This enabled searches for three new faculty and added capacity to acquire more grants for field and laboratory research. In 2003, the university recognized Biology as one of its Exemplary Departments. That year Jones also instituted the annual departmental Research Day, a one-day event in early spring that recognized graduate student achievement with talks by an invited alumnus and senior graduate students, as well as poster presentations, and a concluding awards banquet, complete with music and dancing. Research Day also became an important vehicle for graduate student recruiting. After ten years it continues to be an important day for connecting faculty and students across the department's many subgroups and facilities.



Students present research posters at Research Day 2010

Restructuring brought the College of Arts & Sciences to an end, and Biology joined the new College of Science. Links between Biology and other groups on campus, such as the Via College of Osteopathic Medicine and the VBI were strengthened. Also in 2003, the natural history museum closed, the Bailey-Law bird and mammal collections were moved into the department, and the Biological Sciences Outreach Program was established under the leadership of Michael Rosenzweig to protect the specimens and create broader impacts to the region's preK12 community. This included several undergraduate and graduate activities offered weekly at the local nature center.

In 2004, ground-breaking to erect a new Biology Research Building began, to be completed by 2007 and ultimately named "Life Sciences I." Meanwhile in 2005, Jones added **Daniela Cimini**, **Liwu Li**, **Carla Finkelstein** and **Dorothea Tholl** in 2006, **Diya Banerjee**, **Jeff Kuhn**, **Florian Schubot**, and **Roderick "Rick" Jensen** (VBI) in 2007, **John "Jeb" Barrett**, **Dana Hawley**, and **Jianhua Xing** in 2008, and **Brigit Scharf** and **Daniel Capelluto** in 2009. New hires often encouraged clusters, if possible, to allow formation of research teams. To better reflect the growth in enrollment, diversity and interdisciplinary collaboration involving 43 faculty, seven instructors, 22 post-docs, 20 adjunct positions and 69 graduate students, Jones changed the name to the Department of Biological Sciences. Undergraduate enrollment had increased to >1300 with women comprising about 60%. The number of women faculty hires also had increased [Paterson-2, Stout-3, Cowles-8, Jones-11]. Jones also convened the first Diversity Committee which, among other things, spawned another new tradition, the annual "International Potluck Luncheon" that showcased the diverse culinary tastes and talents of the department's students, staff, and faculty.



Dr. Florian Schubot takes a swing at the pinata at the 2011 Diversity Committee International Potluck Luncheon

Charles Rutherford retired in 2005, and **Thomas Jenssen** and **Stephen Scheckler** joined the emeritus biology faculty in 2007, **Jack Cranford** and **Asim Esen** in 2008, **Robin Andrews** and **Anne McNabb** in 2009. Of the >20 retired faculty whom Jones, Parker, and Stout had organized as OWLS (Older Wiser Leaders of Science) in 2002, about 17 continued to live in the area, and many helped the department in various capacities, as well as meeting for lunches and updates once per month. Jones's energies and vision also focused on leading the department into new frontiers. The faculty continued to pull together to seek significant grant funding and recruitment of top quality post-doctoral, graduate, and undergraduate talent. The department had also become a popular home for high-level administrators, with tenured faculty now including Provost **Mark McNamee** (50% with Biochemistry, in 2001), VP for Undergraduate Education **Daniel Wubah** (in 2009), VBI director **Harold "Skip" Garner** (2009-2012), and VTCRI director **Michael Friedlander** (2010).

A major challenge loomed in 2008 and beyond, namely the dispersal and transfer of Biological Sciences faculty and programs to several new locations. Cell & Developmental Biology moved to the new Integrated Life Sciences Building at the Corporate Research Center about one mile south of the main campus. Microbiology, Immunology, & Structural Biology relocated in the new Life Sciences Building I. Plant Molecular Biology moved to Latham Hall, while Computational Biology and Ecology & Evolutionary Biology remained in Derring Hall. A few other faculty continued to be located at the VBI and new hires started being made at the VTCRI in Roanoke. To maintain cohesiveness for the department now dispersed among six buildings, Jones rotated faculty meetings, seminars, receptions and other functions among the various locations and increased the dissemination of news through email interchanges and an expanded newsletter.



*Derring Hall
Opened 1969*



*Virginia Bioinformatics Institute
Opened 2003 - 2004*



*Latham Hall
Opened 2006*



*Life Sciences Building I
Opened 2007*



*Integrated Life Sciences Building
Opened 2008*



*VT Carilion Research Institute
Opened 2010*

Jones accepted a Deanship at the University of West Virginia to begin in 2010. Prior to his departure, he worked with Brenda Winkel who had accepted the challenge of leading Biological Sciences---now the largest degree-granting unit at Virginia Tech with more than 1600 undergraduate majors and some 400 B.S. degrees conferred annually. Fortunately a number of emeriti faculty were available as full- and part-time instructors to teach some of the general courses and act as undergraduate academic advisors. Full-time instructors and academic advisors **Jack Evans**, **Mary Lipscomb**, Michael Rosenzweig, and **Richard "Tad" Seyler** also worked on departmental committees and course development. Robin Andrews (ret), Robert Benoit (ret), **Sandra Daniel**, Noel Krieg (ret), **Roger Sheppard**, **Esmail Shokraii**, George Simmons (ret), and Bruce Turner (ret) were important part-time instructors whose assistance allowed research and grantsmanship to continue as a major focus for other Biological Sciences faculty, including training graduate students and post-doctoral fellows.

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Brenda Winkel's administration had barely begun when Donald Cherry and Bruce Turner (2010) retired and joined the OWLS. Winkel continued to work successfully to keep the Department of Biological Sciences, now located in several places including rapidly growing numbers at the VTCRI in Roanoke, working together as a single coordinated unit. She hired **Bryan Brown** and **Adi Livnat**, as well as **Deborah Kelly** and **Konark Mukherjee** at the VTCRI, in 2011. The following year, 2012, she hired **Cayelan Carey**, **Joel McGlothlin**, **Michael Strickland**, and **Kendra Sewall**, together with **Greg Valdez** and **Michael Fox** at the VTCRI, the same year that she introduced Biological Sciences e-Notes to enhance communications. Faculty numbers were growing again; now the challenge was to keep up with the accompanying pressures on space and staff support to keep the department moving in the right direction as the focus on the life sciences, and particularly environmental and biomedical sciences, continued to intensify on campus.

Conclusion

These 140 years of biological sciences history at Virginia Tech tell an amazing story of growth in stature, a trend which very likely will continue. Like most land grant colleges, Virginia Tech had modest beginnings. Teaching and research in biological sciences were vital to the success of any agriculturally-focused institution, and these began in the first year (1872) with a few graduates receiving a B.S. in biology as early as 1875. By 1891, a Department of Biology was established with Ellison Smyth as its first head with the Departments of Botany & Plant Pathology, Entomology, Veterinary Science, etc. already in place. On Smyth's retirement in 1925, the same year that the first five women graduated (three in biology), a few unsettled years followed. Then, I.D. Wilson took the reins in 1931 and assembled a huge Department of Biology by 1935, incorporating most of the other biologically focused departments. Not long after Wilson's lengthy administration, Virginia Tech went coeducational which accompanied increases in enrollment, faculty, buildings, and new courses. This led to the Department of Biological Sciences becoming the largest on this campus and highly regarded, both nationally and internationally.

One might be tempted to speculate that Biological Sciences has entered yet a new era with biology spreading through many other fields of science (mathematics, physics, chemistry, geology, engineering). The field of synthetic biology appears to be one such example, because it involves scientists from all these disciplines. We may assume that the future of biological sciences on this campus will continue to develop under the leadership of Brenda Winkel and her successors.

ACKNOWLEDGEMENTS

I am grateful to numerous colleagues for suggestions and contributions, especially Brenda Winkel, Dreama Price, and Michael Rosenzweig.

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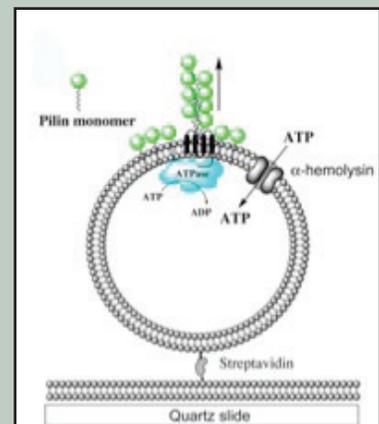
Professor Emeritus
Bruce Parker

Exploratory Research in the Melville Laboratory: Molecular analysis of bacterial Type IV pilus assembly

Type IV pili are bacterial surface fibers that have a range of functions including twitching and gliding motility, adhesion to cells and surfaces, and formation of microbial biofilms. In some metal-reducing bacteria, these pili function as nanowires capable of carrying an electric current. Although Type IV pili are assembled by a protein complex whose components are well known, the mechanism by which pilin monomers are polymerized into a growing pilus is still not understood. The lab of Associate Professor **Stephen Melville** has developed a comprehensive atomic-level model that can account for pilin polymerization in an energetically-favorable fashion; this model is currently being tested by Dr. Melville's research team with funding from an Early-concept Grant for Exploratory Research (EAGER) from the National Science Foundation. Because Type IV pili play an essential role in most environments in which bacteria are found in high numbers, it is expected that the results of this work will benefit society in areas ranging from agricultural safety practices, microbial ecology, and geobiology to nanotechnology for use in industrial applications.



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Experimental setup for organization of type IV pili proteins to polymerize pilins on the outside of lipid vesicles



August 14-16, 2013 • Blacksburg, Virginia

International Conference on COMPUTATIONAL CELL BIOLOGY

From the Past to the Future

Cell biology is currently undergoing an historic transition from a qualitative to a quantitative science. For the past two decades, computational modeling has played a pivotal role in this transition, and now, interdisciplinary collaborations combining both *in silico* and *in vivo* components are the gold standard for cellular research. However, barriers separating the conventional disciplines continue to hinder successful implementation of this powerful hybrid approach, leaving a myriad of complex biological phenomena virtually impenetrable.

Virginia Tech has been chosen as the site of a conference that will serve as a platform for the exchanging of ideas and synthesis of collaborations between experimentalists and theoreticians from a broad spectrum of disciplines and career stages. This conference has been designed to highlight the interplay between cutting-edge biomathematical approaches and experimental techniques, to identify future directions in the field of computational cell biology, and to provide a rare opportunity for young researchers to interact with several leading scientists. It will also feature a special forum to highlight current developments and challenges in interdisciplinary undergraduate and graduate education, both at Virginia Tech and across the nation, including the genesis of new interdisciplinary majors intended to prepare students for the modern research landscape.

Assistant Professor of Biological Sciences **Jianhua Xing** is co-chairing the conference with Professor Reinhard Laubenbacher (VBI/Mathematics). Virginia Tech is actively developing its Computational Cell Biology program and a related Systems Biology undergraduate major. The conference will provide a great opportunity for local and external researchers to exchange ideas both on research and education. Another Biological Sciences faculty member, Associate Professor **Daniela Cimini**, is one of the invited speakers for the conference.



Dana Hawley, Assistant Professor of Biological Sciences, has been awarded a 2013 Certificate of Teaching Excellence from the College of Science, in recognition of her exceptional contributions to the department's teaching mission. Dr. Hawley has taught Wildlife Disease Ecology and Ornithology, developed a course in Infectious Disease Ecology, and mentored 25 students in undergraduate research in her laboratory since arriving at Virginia Tech in 2007.

In 2011, she worked with **Michael Rosenzweig**, Director of the Science Outreach Program, to incorporate service-learning into the Ornithology course. Students worked in groups to design fun educational programs about birds that they implemented on weekends at the Price House Nature Center in downtown Blacksburg. The students then presented their projects to their classmates and wrote papers about their experiences. Overall, the students who participated got a lot out of the experience and enjoyed the opportunity to connect their understanding of science to something in the "real world."

Congratulations, Dr. Hawley!

The Tenth Annual Biological Sciences Research Day was held on Saturday, February 16, 2013 at the Virginia Tech Graduate Life Center. The annual one-day event was developed to provide graduate students with experience in presenting their research to the public, to foster academic and social exchange between research labs, to update alumni on research activities in the department, and to educate prospective students about research in the department. The program and logistics for research day activities are organized by a rotating committee of graduate students, faculty, and staff; this year's committee was chaired by **Jill Sible** (Professor and Assistant Vice President for Undergraduate Education). The **Biology Graduate Student Association**, led by **Michelle Jusino** and **Kevin Geyer**, also played a major role in the planning and execution of the event.

This year, graduate student research was highlighted in a program of five oral presentations and more than fifty posters. Awards were given for the best posters in three different divisions, and for the best oral presentation. The award winners this year were **Bonnie Fairbanks** (Hawley Lab), **Cory Bernhards** (Schubot Lab), **Josh Nicholson** (Cimini Lab), and **Sarah Stellwagen** (Opell Lab).

**BIOLOGICAL
SCIENCES**
Research Day
www.biol.vt.edu



Caren Cooper, Research Associate at the Cornell Laboratory of Ornithology, was the Keynote Speaker this year. She received her Ph.D. from Virginia Tech in 2000 studying under **Jeff Walters**. Dr. Cooper has been on the cutting edge of the field of citizen science for more than a decade; her keynote presentation explained how relocating science into the heart of society by expanding the process known as citizen science can deliver two keys that humanity needs to create a sustainable world: reliable knowledge and social capital.

Grants, Awards, and Other News

Kaitlyn Andreano, undergraduate researcher in the Finkielstein Lab, has been invited to give a talk on her project, "Disabled-2 (Dab-2) modulates platelet-cancer cell interactions through its sulfatide binding domain." In collaboration with **Daniel Capelluto**, Kaitlyn's project will be presented at the National Conference for Undergraduate Research Education at the University of Wisconsin-LaCrosse in April 2013.

Professor **Art Buikema** was appointed Chair of the Undergraduate Honor System for the academic year 2012 – 2013 by Dr. Charles Steger.

Julia Button (major in Biological Sciences and Biochemistry) and **Kelly Drews** (major in Biological Sciences, History and Biochemistry) are among Virginia Tech's four nominees for the Barry M. Goldwater Scholarship for the 2013 - 14 academic year. The purpose of the national scholarship is to foster and encourage excellence in the STEM (science, technology, engineering, mathematics) fields. In addition, it is intended to protect U.S. leadership in science and technology by educating and training new generations equipped to meet ever-increasing challenges.

John Cairns, Jr., University Distinguished Professor Emeritus of Environmental Biological Sciences, has been named a Fellow of the Ecological Society of America. The ESA established this new program to confer the honorary title of Fellow to those who have been recognized by their peers for their distinguished contributions to the discipline.

Instructor **Michael Rosenzweig** was named CIDER Teacher of the Week in May 2012.

Biological Sciences majors **Sarah Deel**, **Joshua Freda**, and **Jacquelyn Martin** were all invited to join Phi Beta Kappa, one of the nation's oldest and most prestigious honor societies.

Professor **Joe Falkinham** was featured on the July 30th, 2012 edition of The Jim Bohannon Radio Show, and again in September on CBS New York TV News discussing the dangers of nontuberculous mycobacteria in household water supplies.

Associate Professor **Carla Finkielstein** was featured on WVTF's "With Good Reason" the week of July 7th through July 13th discussing her research on the effects of circadian rhythms on breast cancer.

Karen Fraley, Office Manager in the Undergraduate Advising Office, was named "Staff Member of the Week" in June 2012. Congratulations, Karen!

Dana Hawley is the PI on a new R01 grant from the NIH. This project, entitled "Ecological drivers of virulence evolution in an emerging avian pathogens," is for four years and totals almost \$2.25M. Dr. Hawley has brought in colleagues at NC State, Cornell, Towson, Connecticut, and Princeton for this major undertaking, which focuses on virulence evolution in the house finch - Mycoplasma interaction (see front page story).

Graduate students **Bin He** (Cimini Lab) and **Sihui Zhang** (Kuhn Lab) celebrated the birth of son Leonardo Hanyao He on November 19, 2012.

Professor **Liwu Li** has been awarded a new five year \$2M NIH R01 grant entitled, "Innate modulation of macrophage homeostasis." The project will explore intriguing connection between atherosclerosis and innate immunity.

Sharmistha Mitra, a graduate student in the Capelluto Lab, has been awarded the American Heart Association's Mid-Atlantic Affiliate Winter 2012 Predoctoral Fellowship. Her research focuses on determining how Tollip, an adaptor protein that controls immune responses and membrane trafficking, is modulated.

Dana Hawley (Assistant Professor) and husband **Jim Spotila** (Professor of Geosciences) celebrated the birth of daughter Emery Faith on August 7, 2012.

Associate Professor **Ignacio Moore** was named CIDER Teacher of the Week in September 2012.

Ignacio Moore and former postdoc, **Frances Bonier**, have a new NSF-funded project entitled, "The Role of Glucocorticoids in Mediating Life History Tradeoffs." The grant is for \$705K and will run for 4 years. You may have read advance notice of this grant in a story run this spring by the Fralin Institute. Note that Fran is currently an Adjunct Assistant Professor at Queen's University in Ontario, Canada.

Advanced Instructor **Jack Evans** was named CIDER Teacher of the Week in November 2012.

Florian Schubot is the PI on a new NIH R21 grant entitled, "Regulation of the *P. aeruginosa* Type III Secretion System by the Multifaceted Transcription factor ExsD," together with co-PIs Rick Jensen and Arkady Mustaev at the New Jersey Medical School.

Professor **Jill Sible** has been appointed Assistant Vice President for Undergraduate Education. She will oversee implementation of the Vision Plan for Undergraduate Education and coordinate undergraduate curricular development and improvement across campuses. In addition, the Office of First Year Experiences, the Office of Curriculum for Liberal Education, and the Office of Undergraduate Research will report to Sible.

Professor **Ann Stevens** was one of sixteen exemplary biologists selected to participate in the 2012 Research Residency of the AMS/NSF Biology Scholars Program.

Reza Sohrabi, Ph.D. candidate in the Tholl Lab, and wife **Somaye Badiayan**, postdoctoral associated in Pablo Sobrado's lab (Biochemistry) celebrated the birth of daughter Sarah in September 2012.

John Tyson (University Distinguished Professor) is the PI on a new \$275K grant from the NSF's Mathematical Biology Program, together with colleagues Mark Paul in Mechanical Engineering and Yang Cao in Computer Science. The project entitled, "Integrated dynamics of temporal and spatial controls in the cell division cycles of *Caulobacter crescentus*," aims to "gain deeper insight into then molecular mechanisms controlling the asymmetric division cycle of a free-living bacterial cell by building mathematical models of gene expression and protein localization within the cell."

Bailey Professor **Jeff Walters** has a new grant from the Department of Defense/Navy to continue work on the monitoring of Red-cockaded Woodpeckers at the Marine Corps Base Camp Lejeune in coastal North Carolina. This is a long-standing (27 years) continuously-funded project that continues to yield new surprises, including recent insights into the relationships between these remarkable birds, pine trees, and fungi.

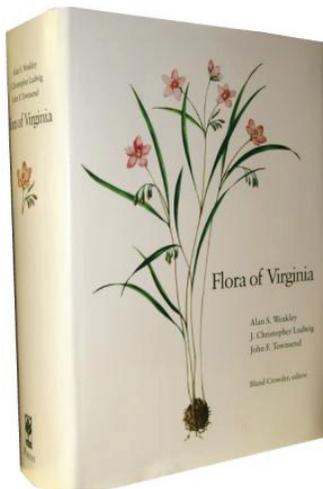
Hardik Zatakia, Ph.D. student in the Scharf Lab, received the Best Student Presentation Award at the 2012 Virginia Branch Meeting of the American Society for Microbiology.

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New Publication! *Flora of Virginia*

Foundation of the Flora of Virginia Project Inc. and Botanical Research Institute of Texas Press have collaborated to publish the *Flora of Virginia*, the first formal update to the state's flora since 1762!



Flora of Virginia describes approximately 3,200 taxa in 200 families and features 1,400 captioned, scaled, and botanically accurate illustrations. Introductory material includes essays on the natural history and vegetation of Virginia and a historical account of botanical exploration in the state, as well as a key to the vascular plant families represented in the Flora. A glossary, bibliography, and comprehensive index are also provided. The flora is beautifully illustrated by three artists, one of whom, **Lara Call Gaster**, completed an M.S. in Biological Sciences in **Dr. Erik Nilsen's** lab.

The Massey Herbarium, located in Derring Hall, is largely an outreach "arm" of the Department of Biological Sciences and played an important role in the development of the Flora. Curator **Tom Wieboldt** has been the site administrator for the online Digital Atlas of the Virginia Flora (www.vaplantatlas.org) since 2005. The Digital Atlas has helped to provide as accurate a picture as possible of Virginia's plant distributions by county. Over the years, innumerable questions arose as to what species were definitely known in the state, where they occurred, in what habitats, in what frequency, and for non-natives, were they naturally occurring and established enough to be included in a flora manual? Using the 107,000 specimens in the Herbarium, Tom researched answers to these and many other questions, especially where taxonomic judgements were needed. Tom was also asked to write the treatment for the quillworts (Isoetaceae) and, with naturalist Ron Lance, the hawthorns (genus *Crataegus*), two of the more perplexing groups of Virginia plants. In appreciation and acknowledgment of the value of the Massey Herbarium to efforts such as this, the Flora Project made a generous donation toward upgrading the Herbarium's Spacesaver mobile storage unit.

The *Flora of Virginia* is available from BRIT Press at <http://www.brit.org/brit-press/books/virginia>. You can learn more about the *Flora of Virginia* Project at <http://www.floraofvirginia.org>, and more about the Massey Herbarium at <http://www.biol.vt.edu/about/herbarium>.