

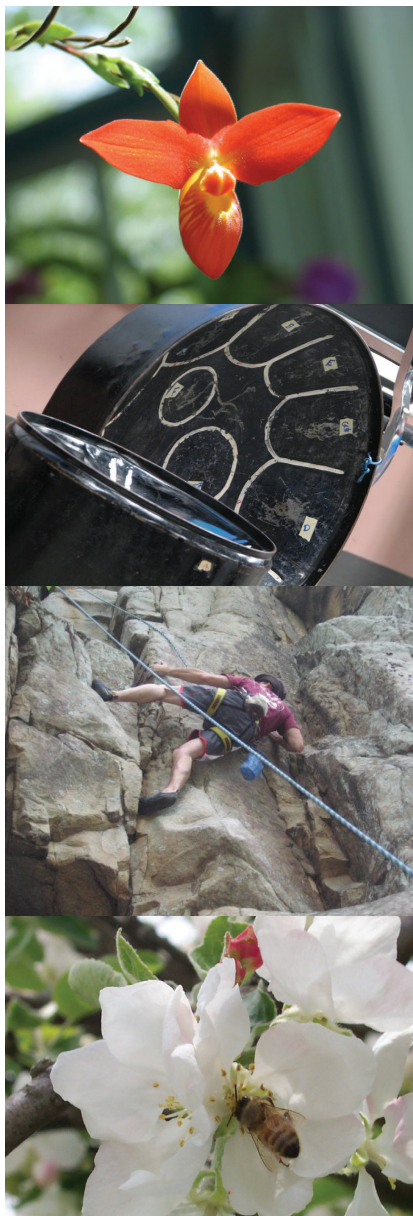
# Biological Sciences

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## All in a Week's Work: The Diverse Activities of The Biological Sciences Family



This issue focuses on the many activities of our faculty, staff, and students. Pictured above (top to bottom): A *Phragmipedium besseae* orchid grown by Steve Scheckler; a steel drum played by David Popham; Ben Orsburn defies gravity on a rock cliff; and a honeybee raised by Laura Link visits an apple blossom. Want to learn more? Turn to page 4.

Not many years ago, a regional politician made the very surprising claim that university faculty work an average of less than 10 hours per week. Of course, the mistake made in this case is simple to explain. Someone assumed that teaching in a classroom is all that faculty do. So, that "someone" counted the total number of hours spent lecturing in a classroom or working with students in laboratory courses, which is indeed a relatively small number, about 3 to 8 hours per week for professors in our department. We know that faculty work as hard as anyone, so what do they do outside of the classroom? The short answer is: a very diverse and challenging set of activities.

Teaching is certainly a major element. Each hour in the classroom or lab is linked to 3 to 5 additional hours dedicated to preparation, grading, and out-of-class meetings with students. OK, so let's say that it takes 15 to 24 hours per week to teach a course. Now let's add all the other teaching responsibilities for faculty; i.e., mentoring undergraduate researchers, graduate students and postdocs; providing career and academic advice for students; sponsoring student clubs; and in some cases writing or reviewing textbooks, submitting proposals to obtain teaching and learning grants, and attending special classes to hone teaching skills. Although there is significant variation among faculty in how much they allocate to each of these teaching and learning activities, the average teaching-related work effort for virtually all individuals is well above 20 hours per week.

In a recent survey conducted by the U.S. Department of Education, faculty reported a mean work week of 53.4 hours, but in the highly competitive and fast paced world of Virginia Tech, I'm certain that most faculty work even longer hours. So, if teaching consumes well over 20 hours per week, then it is safe to say that at least another 20 or more hours are dedicated to scholarship and service. Scholarly research requires highly focused efforts on reading, analysis, preparation of publications and grant proposals, presentations at professional meetings, debates and other modes of information exchange, physical labor to conduct experiments in the laboratory or field, and lots of mundane tasks such as balancing budgets, driving to field sites, and cleaning up the lab (yes, many of us still wash our own dishes!). Though research is clearly a major activity, service is too; most faculty spend 5 or more hours per week in activities that have little to do with publications or classrooms. They review papers and proposals submitted by colleagues, serve as officers in professional societies, organize meetings, participate in projects that help the university run effectively and efficiently, and apply their knowledge and hard work to make our communities better places to live.

Not surprisingly, people who are driven to succeed in a faculty position, which entails a very rich set of activities and responsibilities, are usually very active outside of work too. Biological Sciences faculty are deeply involved in dozens of interesting hobbies, art projects, athletic endeavors, and so on. The same goes for our staff and graduate students. In this newsletter we highlight just a few of these interesting activities. I feel very fortunate to work with so many multi-faceted, highly dedicated professionals.

Sincerely,

Robert H. Jones  
Department Head

*This newsletter was created by Valerie Sutherland, Program Support Technician for the Department of Biological Sciences. We welcome comments and items of interest for future newsletters. Please contact Dr. Robert Jones (rhjones@vt.edu) or 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.*

## IMPORTANT EVENTS

### Celebrating Darwin 2009

By Duncan M. Porter, Professor Emeritus of Biological Sciences

February 12th was the 200th anniversary of the birth of Charles Darwin, and the coming 24th of November marks the 150th anniversary of the publication of his *On the Origin of Species by means of Natural Selection*, arguably the most important book of the 19th century. Darwin celebrations began in England on the first of July 2008 at the Linnean Society of London, which commemorated a meeting on that date in 1858 that presented the principle of natural selection to the world. This meeting was hastily called, in part because two weeks earlier Darwin had received a letter and short manuscript from Alfred Russel Wallace, a British collector who was gathering natural history specimens in the East Indies. Wallace's manuscript laid out his ideas as to how one species arose from another, which mirrored those that Darwin had been working out over the previous 20 years. The next month's *Journal of the Proceedings of the Linnean Society of London* published Darwin and Wallace's so-called "joint paper", including Wallace's manuscript and selections from Darwin's earlier writings that he had shared with others. Thus was Darwin's priority in providing a scientifically acceptable explanation for evolutionary change insured. He immediately began to write a "short paper" (estimating that it would be about 30 pages long) that by a year later had grown into the 502-page *Origin*.

Celebrations have been and will be held all over the world. The one at Cambridge University, Darwin's alma mater, will take place next July, bringing leading scientists, historians, and philosophers from around the world to spend a week discussing the great man. The English will not be outperformed as they were in 1959, when the largest Darwin celebration to commemorate the centenary years was held at the University of Chicago and resulted in three large, scholarly volumes. The celebration in Cambridge that year consisted of a dinner at Christ's College for living members of the Darwin family.

One of the most ambitious celebrations this year has been planned by Virginia Tech's Professor of Art Carol Burch-Brown, who on November 24th will direct her "Singing Darwin". In this event participants will read, sing, and play music from *Origin* and other Darwin works over a 24-hour period from each of the earth's time zones. VT will offer a special course next Fall Semester, "On Darwin's *Origin*", with separate sections for undergrads, grad students, and honors students. It will be taught by Richard Burian, Professor Emeritus of Philosophy, Eileen Crist, Associate Professor of Science & Technology in Society, and me, with guest lecturers from other departments and institutions. November's Choices and Challenges program, chaired by Professor Crist, is titled "Animal Minds". It will follow a day-long symposium, "Celebration of Darwin. A Conference on Darwin's *Origin*", organized by a committee chaired by Ron Lewis, Associate Professor of Animal Breeding and Genetics, to be held on November 4th. Another innovative project in which I have been involved is the Carnegie Museum and Duquesne University's "Synthetic Darwin", where a visitor can ask a Darwin mannequin any of 199 questions and get the answer in Darwin's prose and Shropshire accent.

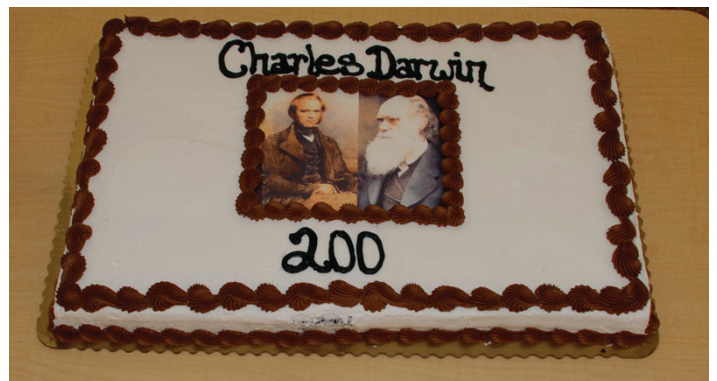
Besides advising numerous individuals and projects on Darwiniana this year, I have given a presentation, "The Evolution of Charles Darwin", at VT, the Museum of Nature and Science in Denver on his birthday (12 February), and at Roanoke College, the North Carolina Botanic Garden, and the National Evolutionary Synthesis Center at Duke University.



Susannah, Duncan, and Sarah Porter "darwinizing" (birdwatching) at Hilton Head Island, SC, November 2008

In August I will participate in the symposium, "Darwin in the Galapagos", where I will talk on "Darwin: The Botanist of the *Beagle*" at the California Academy of Sciences in San Francisco; most appropriate since I began my research on Darwin over 40 years ago on a postdoctoral fellowship at the Academy and Stanford University. In October, University of Edinburgh Press will publish Darwin in the Archives, a special number of Archives of Natural History, to which I wrote the introduction and co-edited.

Professor Porter is the co-author of *Flora of the Galapagos Islands*, co-editor of *The Portable Darwin and eight volumes of The Correspondence of Charles Darwin*, and has authored numerous articles on Darwin. He is a Fellow of the American Association for the Advancement of Science and of the Linnean Society of London. In 2007 the Science Museum of Virginia awarded him its Life Achievement Award in Science.



Bruce Turner, Associate Professor of Biological Sciences, and his Evolutionary Biology students celebrated Darwin's bicentennial February 11th with a cake!

## RESEARCH HIGHLIGHTS

### New models question old assumptions about how many molecules it takes to control cell division

By Susan Trulove, University Relations

A single cell -- whether a yeast cell or one of your cells -- is exquisitely sensitive to its surroundings. It receives input signals, processes the information, makes decisions, and issues commands for making the proper response. As with any control system, noise -- errors, slip-ups, mis-reads -- can get in the way of correct decision making. Virginia Tech biologists and engineers have created a mathematical model to explore the roles of noise in controlling the basic events of the cell cycle -- DNA replication and cell division.

Their work appeared in the print version of the Proceedings of the National Academy of Sciences (PNAS) the week of April 21, 2009 (Volume 106, No. 16), in a special feature issue on complex systems. The article, "Exploring the Roles of Noise in the Eukaryotic Cell Cycle," is by postdoctoral associate Sandip Kar; William Baumann, professor of electrical and computer engineering; Mark Paul, professor of mechanical engineering; and John Tyson, University Distinguished Professor of Biological Sciences.

Their efforts to accurately calculate the effects of noise in a yeast cell revealed flaws in two accepted notions about information processing in single cells: about the numbers of messenger RNA (mRNA) molecules in a cell, and about how long they live.

A fundamental challenge of systems biology is trying to understand the molecular basis of decision making in a single cell. "Information processing is done by a molecular network consisting of interacting genes and proteins," Tyson said. "You could compare it to a computer that is based on integrated circuits or to a mechanical control system based on sensors, wires and servomotors -- except that information processing in cells is unique in two ways. First, the cell is a sloppy, liquid environment, with molecules bouncing around and reacting with one another. Second, cells are extremely tiny; therefore sensitive to random fluctuations in the number of molecules being created or destroyed at any given moment."

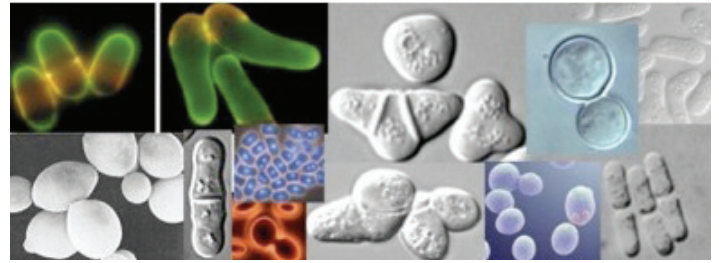
Nonetheless, the ebb and flow of molecules in a cell must reliably convey instructions for such essential processes as DNA replication and cell division.

How big are the molecular fluctuations expected in a single yeast cell? Physicists estimate molecular fluctuation using a rule-of-thumb that the size of typical fluctuations is the square root of the average number of molecules. "If there are on average 900 molecules of a particular protein in a cell, then we can expect fluctuations of plus or minus 30 molecules, or 3.3 percent," said Tyson. "That is not too bad."

For DNA there might be a severe problem, Tyson noted, "because there is only one copy of every gene in a yeast cell. But cells are equipped with an elaborate and expensive mechanism to replicate DNA molecules and not allow the random fluctuations predicted by statistical physics."

The molecule that carries information from the gene to the cell's ribosomes, where proteins are made, is the weak link in the mRNA.

The literature reports that there is on average only one mRNA molecule per gene per cell, in yeast, and that each mRNA molecule lives, on average, for 15 to 20 minutes before it is degraded.



"This is intriguing," said Tyson, "because the physicist's rule-of-thumb would predict very large fluctuations in mRNA abundance -- sometimes one, sometimes zero, sometimes two or three or four -- which means the noise among mRNA molecules is huge, and it propagates to the level of the encoded protein."

The noisy fluctuations in protein level may be 50 percent instead of 3 percent. "There is no way the control system can work in the face of such large fluctuations," Tyson said. "It would be completely unreliable."

Progression through the cell cycle is indeed a noisy process, with typical fluctuations of 15 to 20 percent for the time taken to complete the process. To achieve this level of control, the Virginia Tech researchers conclude, in their PNAS paper, that 1) the average number of specific mRNA molecules must be 5 to 10 times larger than the generally accepted value, or 2) the half-life of mRNA molecules must be 10 to 20 times shorter than the reported value, or 3) the cell must have specific mechanisms for noise reduction in its mRNA populations. Or some combination of these strategies.

"At least we have an accurate model that tells where the questions are," Tyson said. "Computational cell biologists address puzzles like this one by building reliable mathematical models, based on basic principles of physics and chemistry that address the roles of noise and noise reduction mechanisms in living cells."

Tyson, Baumann, and Paul are lead investigators on an National Institutes of Health (NIH) National Institute of General Medical Sciences funded research project that also includes Yang Cao, assistant professor; Cliff Shaffer, professor; Layne Watson, professor; and Adrian Sandu, associate professor, all of Virginia Tech's computer science department in the College of Engineering.

The group is continuing to build more elaborate and accurate models of molecular noise in the cell cycle control system of yeast cells and to compare these models to the latest experimental measurements of molecular fluctuations in single cells.

Learn more about the Tyson group's research online at <http://www.biol.vt.edu/faculty/tyson>.

The Department is pleased to welcome its two newest family members! Camilo Tomás, son of Assistant Professors Lisa Belden and Ignacio Moore, and Avery Mitchell, daughter of Research Associate Kevin Rose (Walters Lab) and his wife Jackie.

Both babies were born on May 1, 2009.

## ALL WORK AND NO PLAY....(you know the rest!)

Many of the Biological Sciences faculty, staff, graduate students, and OWLS are involved in a variety of fascinating activities outside of their busy work schedules. We've outlined a few below.

**Laura Link**, Advanced Lab Specialist in Microbiology, and husband Andy have been involved in beekeeping for the past four years. Her grandparents kept bees, so she decided to take an introductory course on beekeeping that was offered by the YMCA. She furthered her education the next year by sitting in on Richard Fell's beekeeping course at Virginia Tech, and now is working on a research project, in conjunction with Dr. Fell and Biological Sciences student Dana Gilmore, that is based on bacteria in Virginia honey samples. In addition, she travels to elementary schools and fairs to educate on beekeeping, and teaches portions of the New River Valley Beekeeping Association Beginning Beekeeping classes. Last spring, she attended the state beekeeping meeting, where she met leaders in the field.



"I honestly believe honey bees are the most interesting creatures on the planet," says Link. "Catching your first swarm is thrilling, to say the least. Every time we get into a hive, I learn something new." The best part of beekeeping? "Honey, baby! And, our garden is much more prolific, our neighbors are thrilled to have honey bees around (really), and the trees and flowers just look better. Last year we had bumper crops of apples, to the point that tree limbs broke from the weight!"

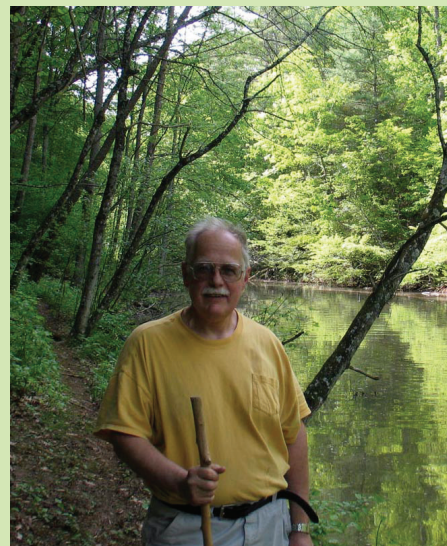
How does she manage time between work and beekeeping? "You just have to manage for the things you want to do, and make the commitment to do them. Keeping honey bees is like any agricultural pursuit - you get them and you are obligated to take care of them," says Link. "Honey bees are efficient, resourceful and absolutely essential. Besides producing honey, which we steal from them, their main contribution to the planet is in pollination. Value estimates range from \$8 to \$14 BILLION each year. In California alone, approximately 1 million hives are needed to adequately pollinate just the almond crop."

**Stephen Scheckler**, Professor Emeritus of Biological Sciences, became interested in exploring, hiking, and plants early in life; his father was an avid outdoorsman and gardener, and passed on his love of both to Scheckler and Scheckler's twin sister during their childhood in New Jersey. Scheckler went on not only to pursue an education and career in botany, but also transferred his love of the outdoors and botany into his outside activities, including his love of growing orchids and his passion for hiking and travel in exotic locales, from Ellesmere Island, to the Sahara, to rural China. Another important activity of Scheckler and his wife, Rebecca, is their involvement with land conservation, which he explains below.

"Loving and exploring 'wild' places has become our lifestyle. Rebecca and I assembled three parcels totaling 38 acres along the shore of Claytor Lake (Pulaski County's AEP hydroelectric impoundment of the New River) that we placed into a permanent conservation easement with the Virginia Outdoors Foundation, a commonwealth-founded organization. Our home on the cliffs overlooking Claytor Lake was built to accommodate minimal disturbance of the site and provide solar and geothermal heating/cooling.

Most of our land is mature or successional hardwood forest, but includes over one-half mile of cliff-faced lakeshore and over one-quarter mile of stream/wetland that flows into a lake cove. Because of its north slope/south slope terrain and lakeside/streamside landscape our small property contains many vegetation life zones and uncommon flora and fauna. We hike its trails and roads every day with our two dalmatians.

Since retiring from Biology in 2007 I have become a board member for the New River Land Trust, which is a state agency with a local focus that promotes land conservation by helping landowners through the easement process and realization of the tax advantages that accrue. In addition to preserving land for future generations, conservation easements in Virginia provide many financial advantages that can help a family retain a farm or large tracts that might otherwise be developed. This helps all of us by preserving watersheds, critical wildlife habitat, and scenic viewsheds that we can all enjoy."



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Ph.D. Student **Ben Orsburn**, from the Popham Lab, began rock climbing just after he received his undergraduate degree in 2003. He participates in class 5 rock climbing, which he describes as “the classic ‘hanging off a cliff by one hand style that is very popular in motivational posters.” He started out by taking a course at Seneca Rocks, WV, and has been hooked ever since.

According to Orsburn, this area makes it easy to be a rock climber. “The New River is amazing. I can take a long dinner break and get down to McCoy or McAfee’s (Knob),” states Orsburn. “Bo-zoo Rocks is an amazing one-mile cliff about one hour from here that no one but climbers know about, perfect for a half-day trip.”

In the last year and half, Orsburn has been able to increase the amount of time he spends climbing. “I introduced by fiancé to the sport, and she took to it like a monkey,” he says. “We get out at least once a month, regardless of the weather.” Last fall, Orsburn was even able to travel to Jamaica to take place in a rock climbing competition. He says, “winning both times scored me two liters of so-so Jamaican rum and the nickname ‘spiderman’ for the rest of my stay there.”

“My favorite part of the sport is when I find a route that I can’t finish,” explains Orsburn. “When I know that someone else has climbed this, but every ounce of effort I have can’t get me up. I may try it a dozen times and limp for a week, but knowing it is out there and someone else can do it makes me train even harder for the next time.” As far as making time for climbing is concerned, Orsburn says, “I wish I could integrate it into my work! I can’t tell you how jealous I am of the ecologists for getting to work outside. That’s why I make fun of them all the time.”

(His description of the photo: “I think the picture is funny. I don’t think it looks very impressive at all until you realize that the ropes are vertical since the belayer is below me, then it show how different moving up a rock can be to more typical motion.”)

**Anne McNabb**, Associate Dean of the Graduate School and Professor of Biological Sciences, grew up cooking on her parents’ farm in Canada. “This meant things like putting a big meal on the table for 20 men on thrashing crews during the summer, or feeding an impromptu meal to a large family who just dropped in to socialize,” says McNabb. Her interest in food grew as she became enamored with Chinese food in as an undergraduate; she would eventually go on to learn to prepare Chinese banquets while she was in graduate school.

Chinese food may have started it all (she and her husband own over 70 “well-used Chinese cookbooks!), but McNabb went on to learn to cook cuisines from a variety of cultures, including Thai, Indian, Moroccan, Greek, Spanish, Mexican, Caribbean, and others. “Often my travel has been associated with academic meetings and that has provided the opportunity to not only learn about different cultures, but also to explore new international cuisines,” she says, “whenever my husband and I travel, we explore new foods, usually come home with new cookbooks, and then start working more on that new cuisine.”

McNabb’s early experiences on the farm and later work experiences influenced her cooking in a number of ways; “My mother taught me good basics about cooking. If one cooks well, those around you are happy to have good food, so there are lots of personal rewards. Cooking for large numbers on the farm taught me organizational skills in cooking...lab skills also have lots of relevance to the kitchen.”

Cooking in the evenings and on weekends acts as a sort of therapy for McNabb; she explains that “I love the way that good food stimulates social interactions. I consider preparing an international, multicourse dinner party for 8-10 people on a Saturday afternoon to be wonderful recreation.” She recently cooked a multi-course Chinese dinner for approximately twenty Chinese graduate students, to whom she and her husband are host family. “One of them said he tells his friends that I am his faculty friend who grew up in Canada who makes the best Chinese food he’s had in Blacksburg,” says McNabb. “I am honored by that compliment.”



**David Popham**, Professor of Biological Sciences, plays the steel drums in two Blacksburg community steel drum bands, “The Panjammers” and “Island Pan.” Popham says, “I started out about four years ago. I saw the bands playing in the VT Summer Arts Series, and the band leader described a summer beginning-players program. I had always loved the steel drum music, so I gave it a try.”



The steel drums became somewhat of a tradition in the Popham household. “My wife and two children all participated in the band with me for a year or two. My wife and son have stopped now, but I’m thrilled that it is one activity that my teenage daughter will still participate in with me,” says Popham.

Popham has had the opportunity to travel to several festivals with the bands; two years ago, The Panjammers won a gold medal at a steel drum festival in Virginia Beach. Another recent festival at JMU celebrated the retirement of Ellie Mannette, the inventor of the modern steel drum. Popham explains, “Ellie grew up in Trinidad, and before 1947, each steel drum had at most two or three notes. He perfected the process of producing drums with 10 to 30 notes, and produced many different instruments, from the deep basses to the high leads. He eventually became a faculty member at WVU and has been a major driver of spreading the steel drum worldwide. It was a great thrill to meet him and hear him play.”

Popham has learned to successfully integrate his hobby in with his work time and his family time. He says, “I look forward to our weekly practices as a time to do something COMPLETELY different from the constant rush and stress of time in the office and the lab. Because my daughter plays with me, it actually helps me increase some family time.” (For more information on The Panjammers and Island Pan, visit [blacksburgsteelpans.blogspot.com](http://blacksburgsteelpans.blogspot.com).)

## VT BioSPIRE: Novozymes Partner's Day, April 27, 2009

On April 27, representatives from Novozymes visited Blacksburg for a Partner's Day event, one of four kinds of activities that VT BioSPIRE is using to lead the growth and success of biotech in the Mid-Atlantic region. The other three are: 1) the Department's Annual Research Day, 2) the recruitment of top student prospects from underrepresented groups into the Biological Sciences undergraduate degree program, and 3) a grant program to support student research.

At the beginning of the meeting, we reviewed progress toward student recruitment, which has shown some early success; this spring we had a 1% increase in the proportion of freshmen recruits who are top scholars from underrepresented groups. This meets our annual goal and provides a base for more progress next year. We also reviewed the status of our new undergraduate research program, which was launched in fall 2008 and has already provided grant support to students studying plant evolution, volatile emissions from plant roots, and mitotic chromosome mis-segregation.

The core of the meeting was dedicated to research and development. **Christian Schobert**, Senior Scientist at Novozymes Biologicals, Inc., reviewed current biotechnology research at Novozymes. **Jonathan Leder**, Director of Technology for Novozymes, provided additional insight into the future of biotech R&D. Two graduate students presented their dissertation work; **Justin Tanner** discussed his study of antimicrobial red soils in Jordan and **Jared Heffron** presented early results of his research on the germination-specific lytic enzymes of *Bacillus anthracis* spores. The final two presentations were made by faculty. **Stephen Melville** outlined his work with Type IV pili and Type II secretion in bacterial pathogens, and **Ann Stevens** reviewed her research program in bacterial quorum sensing. The meeting ended with informal discussions on opportunities for collaborative research and student exchange. We look forward to hosting our other partners in the coming months. For more information on BioSPIRES, visit [http://www.biol.vt.edu/bioSPIRE/BioSPIRE\\_Index.html](http://www.biol.vt.edu/bioSPIRE/BioSPIRE_Index.html).



The OWLS, our **Older Wiser Learned Scientists**, have continuously met several times per semester to keep involved with university programs, and sustain the strong sense of community that characterizes our department. Shown in the picture is the most recent (and largest!) gathering of the OWLS and current faculty at a luncheon held on February 19, 2009 at Bogen's Restaurant in Blacksburg.

Standing, left to right: Al Hendricks, Bob Jones, Ernie Stout, Allan Yousten, Asim Esen, Bob Benoit, Noel Krieg, Al Heath, Jack Cranford, Jay Stipes, Duncan Porter, and Bill Claus

Seated, left to right: Tom Jenssen, Bruce Parker, Daniela Cimini, and Steve Scheckler



## Inspiring Young Scientists

Gilbert Linkous Elementary School, in Blacksburg, held its 7th Annual Science Fair on March 25, 2009, which included voluntary projects created by nearly seventy students from grades K through 5. Graduate students from the Department of Biological Sciences, along with other VT students from various science clubs, volunteered their time to act as judges for the fair and to share their knowledge with the children. **Ann Stevens**, Associate Professor of Biological Sciences, acted as Chairwoman of the science fair committee. "The focus is on the Gilbert Linkous students to get them excited about science," Stevens said, "but then we have a connection to Virginia Tech with grad students serving as the judges and the science clubs providing a free mini traveling science museum for the families of the school."

The elementary school students were asked to follow the scientific method to create their projects, and the ideas that they came up with varied widely, from learning about red-eye in photos, to testing the protective strength of different kinds of paper, to exploring the salinity of water. All of the students received a certificate for their presentation, and there were 1st, 2nd, and 3rd place prizes given within each grade. The fair was a great success, and was enjoyed by everyone involved, including our graduate students! The event was also covered by The Roanoke Times.

The following Biological Sciences students volunteered their time: Randi Lieberman, Tamisha Vaughan, Robert Northington, Milagros Perez, Nimi-sha Khanduju, Saylem Ingalls, Revathy Ramachandran, Lorna Ringwood, Emily Lambert, Katie Rodgers, Amanda Cronin, Brandi Echols, Michael Chanov, Kimberly Haynie, Jonathan Moore, Sheena Friend, Peter Bowerman, Ryan Anderson, Martha Vaughan, Gaurav Dogra, Michelle Jusino, Casey Jakubowski, and Cory Bernhards.

## GRANTS, PRESENTATIONS & AWARDS

**Robin Andrews, Klaus Elgert, and Rich Walker** received the 2009 Department Outstanding Teaching Awards.

**R. Travis Belote** (Jones Lab) received a 2009 Graduate School Commendation for an Outstanding Dissertation in Science & Engineering.

**Art Buikema** received the 2009 Department Outstanding Undergraduate Advisor Award.

**Sunny Crawley**, a doctoral student in the Hilu Lab, received not only the 2009 Department Graduate Student Teaching Award, but also the 2009 Graduate Student Teaching Excellence Award from the Virginia Tech Graduate School.

Students **Ray Danner** (Walters Lab), **Lu Gan** (Li Lab), and **Pam Widder** (Belden Lab) received Ph.D. 2010 Fellowships. **Damon Ely** (Valett Lab) received the Mark Maly Graduate Fellowship; **Bonnie Fairbanks** (Hawley Lab) received the John Cairns, Jr. Fellowship; and **Jenifer Walke** (Belden Lab) received the Cunningham Fellowship.

**Brandi Echols**, a doctoral student in the Cherry Lab, received the 2009 College of Science's Roundtable "Make-a-Difference" Scholarship for Graduate Study.

**Jack Evans** and **Jeff Walters** received the 2009 Department Outstanding Service Awards.

Graduate Students **Erin Hewett** (Walters Lab) and **Gayatri Ankem** (Capelluto Lab) won First Place Poster Awards at the department's 2009 Research Day. **Mauri Liberati** and **John Herbert** (Walters Lab) and **Emily Lambert** (Popham Lab) won Second Place Poster Awards, and **Camille Harris** (Hawley Lab) and **Benjamin Orsburn** (Popham Lab) won Third Place Awards. **Kevin Crosby** (Winkel Lab) received the award for the Best Oral Presentation.

**Khidir Hilu** travelled to Iraq this spring as part of an education mission team organized and sponsored by the U.S. Department of Defense. He was one of two Virginia Tech faculty, three Michigan State faculty and administrators, and one University of Idaho faculty member. They visited three universities in the country and met with Ministers of Higher Education and Research, Science and Technology, Industry and Minerals, and the U.S. Undersecretary of Defense. Virginia Tech is working on a plan to submit to the Department of Defense to assist Iraq in various areas of teaching and research.

**Renee Irvin**, a laboratory specialist in the Microbiology/Immunology Labs, was presented with a 2008 Outstanding Performance in a Lab Award. The new award recognizes an individual or team for performance supporting research in a non-administrative position, honoring recipients for exemplary accomplishments, professional development, and any relevant background and experience demonstrating how the individual or team interacts with colleagues and students.

**Andrew Lucas**, from the Finkielstein Lab, received the 2009 Department Undergraduate Research Award.

**Anne McNabb** received the 2009 College of Science Diversity Award.

In March, **Mike Rozenzweig** was elected as a member of the Town Council of Blacksburg.

**Muyao Shen** (Cimini Lab) was named as a Doctoral Scholar for the Institute of Critical Technology and Applied Sciences. The program honors exceptional students through award of full financial support for the Ph.D. qualifying period.

**George Simmons** was chosen as a recipient of the 2009 Annual Students' Choice Award for Faculty Member of the Year. He also received the Most Influential Professor Award from the Biological Sciences Graduating Class of 2009.

**Ann Stevens** was one of two recipients of the 2009 Virginia Tech Alumni Award for Excellence in Teaching.

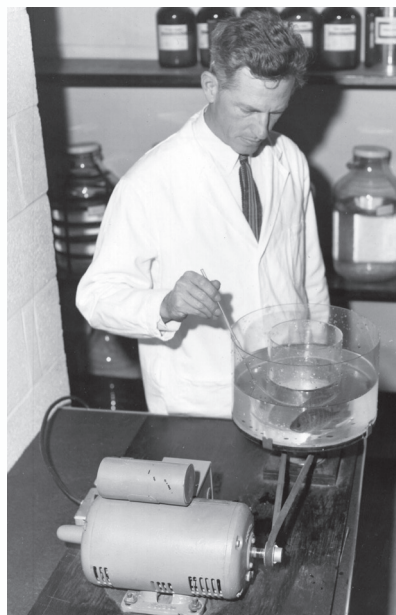
**Christina Tisdale** received the 2009 Department Outstanding Senior Award.

**John Tyson** was elected as an Associate Member of the Royal Academy Science, Humanities, and Fine Arts of Belgium, which is celebrates its 240th anniversary this year. He also received the 2009 Department Outstanding Research Award.

### Cairns honored with Special Session at SETAC

**John Cairns, Jr.**, University Distinguished Professor Emeritus of Environmental and Biological Sciences, was honored in a Special Session at the 2008 Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC) held in Tampa, FL. The session, entitled "Putting the Eco in Ecotoxicology", included "presentations that explicitly attempt(ed) to incorporate an understanding of ecological repercussions from indirect mechanisms of effect, and the testing of ecological theories in an ecotoxicological context."

The session, co-chaired by Sean Richards (University of Tennessee-Chattanooga) and Mark Hanson (University of Manitoba), included a slideshow of photographs spanning Dr. Cairns' 60-year career, and a special written address from Dr. Cairns' was presented to the session attendees. From the address: "If humankind wishes to avoid extinction, it must develop a nurturing relationship with the biospheric life support system. Ideally, all humans should participate in this endeavor. Ecotoxicologists who study the effects of stress on individual species and natural communities are ideally situated to play a major role in this undertaking if more eco is put in ecotoxicology. The ultimate fate of individual species is extinction, but an intelligent species should be able to extend its time on the ecological stage of the evolutionary theater!"



*John Cairns, Jr. tests a new apparatus for swimming speed after exposure to toxicants, circa 1953. For more information on Dr. Cairns' research and career, including photos, visit his website at [www.johncairns.net](http://www.johncairns.net).*

Say hello to the future.



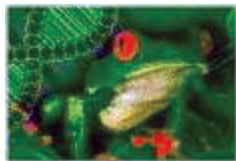
Meet Jeff Walters, the Harold Bailey Professor of Biology at Virginia Tech, and one of the nation's best-known and most respected scientists in the field of conservation biology. Walters' efforts to protect rare and endangered species of birds – including the red-cockaded woodpecker and the Laysan duck – have taken him around the world, and helped preserve these species for future generations.

When you support the Department of Biological Sciences at Virginia Tech, you are inventing the future. You are creating the next generation of scholars, men and women like Jeff Walters, who will find ways to preserve our past as they invent the future.

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