

## Discoveries on the Frozen Frontier: Hokies in Antarctica!

*"This was one of the best courses taken during my college career. With weekly lectures from Antarctic experts from around the world, I learned from researchers that dedicate their lives to understanding this vast, uninhabitable continent." –Sara Schlegel (Biological Sciences Class of 2012).*

BIOL 3954, Hokies Abroad Antarctica is a six-credit study abroad course led by research scientist **Lori Blanc**. This course is open to all majors and consists of an online fall semester course with a two-week field course over winter break. Dr. Blanc has offered this course since 2009 in collaboration with faculty from several other universities. Since then, 45 students have been enrolled, representing 10 universities, 20 majors, and academic levels ranging from sophomores to seniors.

Students are inspired to study in Antarctica for different reasons. For **Matt Hedin** (Biological Sciences Class of 2014), going to Antarctica was a lifelong dream – so much so, that Matt chose to study at Virginia Tech specifically because of our Hokies Abroad Antarctica course! For **Shannon Wendt** (Biological Sciences Class of 2012), studying in Antarctica simply runs in her blood. Her father and uncle, both alumni of VT Biological Sciences, studied in Antarctica with Professor Emeritus **Bruce Parker** (1976-77) and another uncle studied in Antarctica with Alumni Distinguished Professor Emeritus **George Simmons** (1980). Shannon describes her experience below:



The 2011 Study Abroad Antarctica Group



Shannon Wendt, Class of 2012

"What are you doing over winter break?" is a commonly asked question at Virginia Tech. This past year, I answered this inquiry by mentioning my upcoming two-week expedition to Antarctica. In response, people asked "How long does it take to get up there?" or "Does anyone live there?" My peers' genuine naivety about Antarctica made me even more conscious of my imminent journey to this seemingly extrasolar location. I had mentally prepared myself for the long flight to the southern tip of Argentina, and for the two days it would take to cross the Drake Passage, but I was truly unprepared for the reactions I received from people upon hearing about this expedition. These inquiries further emphasized Antarctica's physical isolation from the rest of the world and how our society neglects to consider the global influence of this continent, which plays a highly integrated role in our planet's biosphere.

In the Fall lecture segment of this course, I was excited to learn that our upcoming voyage coincided with the 100-year anniversary of Scott's fateful expedition to the South Pole. I studied the Antarctic Treaty, which establishes Antarctica as a place of international peace, cooperation, and scientific investigation. I learned about the Antarctic Environmental Protocol and Committee for Environmental Protection, weather and climate extremes, flora and fauna adapted to thrive in harsh environments, and rapidly changing glaciology patterns as indicators of climate change. During the field course, I studied Antarctic wildlife, and experienced the psychological effects of Antarctica's unusual seasonal patterns as the 24-hour daylight lifted my spirits and energy. The impacts of tourism in Antarctica, and Ushuaia, Argentina - a gateway community for Antarctic expeditions - are beyond what I imagined. By interviewing local citizens and expedition passengers, I learned that Ushuaia residents appreciate the economic benefits provided by growing Antarctic tourism, but also face associated challenges, such as cruise ship waste and water shortages. Fortunately, passengers on our ship respected and abided by the International Association of Antarctica Tour Operators tourist guidelines, and recognized the importance of on-board education programs. (continued on page 3)

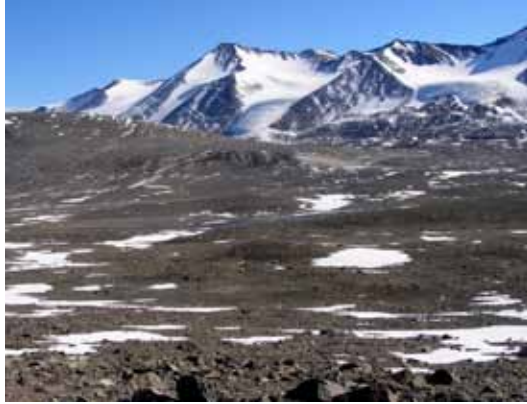
### A Message from our Department Head

*Did you know that our department has a long history of research and training in Antarctica? This newsletter highlights some of the latest activities in that frigid continent – on this page you can read about **Lori Blanc's** involvement with the Study Abroad course that she has helped lead since 2009. On page 2, we report the activities of **Job Barrett's** group, studying microbial communities in riparian zones adjacent to freshwater streams. It takes a special breed of scientist to endure the lengthy travel and embrace the harsh conditions found even in Antarctica's summer! The articles give you a glimpse into just what it is that draws them to this remarkable environment.*

*Remarkably, the current Antarctic projects follow on the work of three emeritus professors of biological sciences, Drs. **Benoit, Parker, and Simmons**, who worked and published their research on microbial and algal life in freshwater lakes in the 1970's, 80's, and 90's, including a Nature article that appeared in 1982. As those of you who attended recent department commencement ceremonies will know from the announcement of the senior class of 2012's "Most Influential Professor" award, Dr. Simmons (who has won this award in three of the past four years) was the first person to dive beneath 30 ft of ice in a freshwater lake in Antarctica. Amazingly, **Shannon Wendt**, who is featured in the article above, has family connections with this past history through research that her father and two uncles carried out with Drs. Parker and Simmons!*

*We hope you enjoy reading the articles in our SPRING/SUMMER 2012 newsletter, which cover many other topics of interest, as well. The department continues to grow and thrive, with faculty, students, and staff working together to maintain our tradition of excellence in teaching, research and service. We also take great pride in our graduates (two of whom are featured on p. 5), who continue to go on successful independent careers. Remember that we love hearing from you – photographic and factual contributions to our history and stories of your own adventures and achievements would be gratefully received. --- **Brenda S.J. Winkel***

## Polar Inquisition: Discovering Life in the Deserts of Antarctica



(Adapted from an article by Catherine Doss, College of Science)

For more than a decade, **Jeb Barrett**, associate professor of Biological Sciences, has been uncovering surprises in his quest to determine how long-term climate trends affect ecological processes. Barrett is part of a group of scientists from nine universities who conduct research under the auspices of the Long-Term Ecological Research Network, an NSF program that sponsors multidisciplinary studies of the ecosystems in an ice-free region of Antarctica. Barrett and his colleagues, who are physical scientists, biologists, and ecologists work in the McMurdo Dry Valleys in the eastern region of the Antarctic. Barrett is assisted in his research by postdoc **Erik Sokol** and graduate students **Adam Altrichter** and **Kevin Geyer**.

From this rugged vantage point, Barrett is examining what controls the distribution of microorganisms in these frigid conditions. The forms of life he studies are primitive; mostly bacteria, fungi, and roundworms. Through soil samples and DNA testing, he studies the spatial distribution of these organisms, focusing on such questions as: Are these life forms universally distributed? Or are they distinct populations that are the result of local evolutionary processes?



"We're looking at what distinguishes the distribution of microorganisms at very fine spatial scales ranging from centimeters to meters," Barrett says. "While climate change is the ultimate context in how we do the work, we're also trying to determine how systems work under natural conditions." The diversity of species within individual communities in the Antarctic environment is surprising. "We found bacterial diversity as high as what you would find in tropical rain forests," he says. "This diversity allows us to look at the effects of climate change on individual species and in turn look at how the removal of certain species or the movement of species will influence ecological processes. Basically, what controls the limits to the distribution of life?"

Because these organisms are microscopic, Barrett's team uses molecular techniques to study how they function in the environment. Genetic observation is easier and more effective than trying to measure a change in a slow-moving ecosystem function, such as carbon or nitrogen cycling.

"This region of Antarctica is probably one of the most extreme environments in terms of water and nutrients and one of the most poorly studied," Barrett says. "Only within the last decade have people started to look at the microbiology in the soils. In fact, some of these environments were described as 'sterile' as recently as the 1970's."



By isolating the organisms from the soil, the research group hopes to start identifying which genes in the microorganisms are actually functioning, i.e., which organisms are alive and responding to environmental changes. Barrett noted that currently there is no consistent climate trend in the region due to seasonal holes in the ozone layer of the atmosphere that can cause rapid and fluctuating changes in temperature. By learning what the impact is on ecosystems at the local level, Barrett hopes to get a better understanding of the effects of global climate changes.

Barrett says what he is learning in the harsh world of Antarctica can be applied to more temperate environments. "My research looks at what the impacts on ecological processes are now," he says. It's one thing to talk about climate changes over the next 50 to 60 years, but the Antarctic is an environment where we can measure impacts quickly. On a fundamental level, it helps us understand what the controls over the distribution of life are."

For more information on Dr. Barrett's research, visit <http://www.biol.vt.edu/faculty/barrett/>



The photos on the left, from the 2009 - 2010 Antarctica field season, were provided by graduate student **Adam Altrichter**, who defended his M.S. this spring. He was also named 2012 Outstanding Master's Student by the College of Science. Congratulations, Adam!

**Top photo:** The lower Wright Valley contains several snow packs that are study sites.

**Second photo (L to R):** Kevin Geyer, Jeb Barrett, and Adam Altrichter standing on the summit of Mt. Rae, overlooking the upper Taylor Valley

**Third photo:** Adam's tent near the Canada Glacier

**Bottom photo:** Field Labs at Lake Hoare



## Cultivating Undergraduate Excellence

*(Adapted from The Virginia Tech Magazine, winter 2011-2012, "The Flourish of Discovery: In Latham Hall, philanthropy helps research take root," Denise Young, Rommelyn Conde '07, and Olivia Kasik; Photo by Jim Stroup)*

In a Latham lab run by biological sciences Associate Professor **Dorothea Tholl**, senior biological sciences major **Tim Nguyen** ('12) has examined the chemical communication of plants with their environment. More specifically, Nguyen has studied how phytochemicals protect the roots of plants against soil-borne pests and pathogens and explored the cell-specific organization and molecular regulation of chemical defenses in roots. Funded by a National Science Foundation (NSF) Research Experiences for Undergraduates supplement, Nguyen's research project aimed to uncover natural ways for plants to protect themselves from their "enemies." The goal is to eventually apply this knowledge to develop novel and sustainable pest/pathogen control strategies.

Nguyen came to Tech as a business major, but he soon realized that any job revolving around office work was not for him. Remembering his affinity for playing outside and reading National Geographic as a child, Nguyen decided in his sophomore year to switch his major to biological sciences. He then began working in Tholl's lab as a summer intern in May 2010. He had discovered the opportunity through the Multicultural Academic Opportunities Program, an academic enrichment program aimed at promoting the diversification in the student body at Virginia Tech, particularly in STEM areas.

Combined with Tholl's mentoring, the lab experience has helped Nguyen gain invaluable knowledge. "I've seen [Nguyen] grow in terms of his understanding of how to approach research, how to troubleshoot protocols and experimental approaches, and how to communicate with the graduate students, postdoctoral fellows, and other scientists," Tholl said. Tholl's research team in the spring semester consisted of a postdoctoral fellow, two graduate students, and three undergraduate students, including Nguyen. "Any student benefits from undergraduate research, not only [gaining] an understanding of lab skills and a sense of how things are done, but also [gaining] maturity and a sense of independence," she said.

In addition, Nguyen has gained experience in one of life's toughest lessons: time management. "Before I started working in the lab, sometimes I was productive, sometimes I wasn't. But the moment I started working in Dr. Tholl's lab, it forced me to be more efficient with the time I have," he said. Nguyen devoted about 10 to 15 hours per week to lab work.

In spring 2012, Nguyen presented his research at two undergraduate research conferences at Tech, the Molecular Plant Science Mini-Symposium and the Virginia Tech Biological Sciences Research Day. Following graduation, Nguyen intends to spend a year gaining clinical experience before applying to medical school. According to Tholl, Nguyen has acquired skills that will benefit him, no matter where his career takes him. "His undergraduate research experience has prepared him well for his future studies and professional development," said Tholl.



*Senior biological sciences major Tim Nguyen is learning how to protect plant roots in Associate Professor Dorothea Tholl's lab.*

### **Discoveries on the Frozen Frontier: Hokies in Antarctica!** *(continued from page 1)*

I returned home from Antarctica on New Year's Eve, eager to share my experience with family and friends. For hours, I elatedly recounted the details of my experience, but as my thoughts settled, a strange sadness overcame me. I yearned to be back on our expedition vessel, the Akademik Ioffe, waiting for the announcement to "head to the gangway!" My time in Antarctica changed me - I now feel put-off by superficial conversations about celebrities and the congestion of people in Times Square on Dick Clark's New Year's Eve program. Antarctica's extreme landscape and profusion of wildlife had swept away all that was familiar and cleared my mental slate of final exam or post-grad career anxieties. Its panoramic immaculateness provoked a sensationally chaotic mix of excitement, tranquility, and greater perspective within me. I now want to be a more significant player in my own



life and the global community, putting meaningful purpose into each day. I am now armed with a newfound awareness of environmental conservation and a responsibility to preserve Antarctica's pristine and unspoiled magnificence. Although I am unsure what higher purpose is intended for me, after experiencing such an awe-inspiring place like Antarctica, I can confidently assert: there are no limits. -- **Shannon Wendt, Class of 2012**



*For more information on the course and additional photos visit [http://www.biol.vt.edu/news/images/antarctica\\_2011\\_photos.html](http://www.biol.vt.edu/news/images/antarctica_2011_photos.html)*

## The History of Biological Sciences, Part II

By Professor Emeritus **Bruce Parker**

(Continued from the Winter 2012 Biological Sciences newsletter)



**Irl Donake Wilson** had been head of the Department of Veterinary Science from 1923-28, joined the Department of Biology, and became head in 1931. Soon after taking charge, Wilson established the first undergraduate degree in Biology. However, the 1933-34 catalog states that Biology graduates had totaled 53 since 1875, the first year that degrees were bestowed at VAMC. In 1935, Wilson organized botany, bacteriology, plant pathology, zoology, entomology, animal pathology, forestry, and veterinary science into a very large Department of Biology. In 1940, he established an M.S., and a few years later a Ph.D. in Biology. In 1944, the name of Virginia Agricultural & Mechanical College & Polytechnic Institute since 1896 was shortened to Virginia Polytechnic Institute. In 1949, the large Department of Biology was reduced by creating the Department of Plant Pathology & Physiology. In 1957, Academic Buildings 1 and 2 were razed. Naturally, other more modern buildings had taken their place, as illustrated by an excerpt from Wilson's 1954 Christmas letter to Lucy Lee Lancaster:

*During the year the new veterinary research laboratory was finished so we are now well equipped for that phase of the department. When the veterinarians move to the new lab (which is located on the Prices Fork road, just beyond the new golf course, now under construction - the old Experiment Station orchard when you were here) it made additional space available for the rest of our department. We moved the forestry and wildlife sections to the basement and have converted the fifth floor into two very modern bacteriology labs - one for research and graduate teaching and the other for seniors. The other end of the top floor, we are converting into a freshman biology lab. We have also provided additional space for entomology. We have added several new members to the staff and I believe that your old department is better equipped for teaching and research than ever before. At least our graduate students seem to think so - all 32 of 'em. Over half of the latter have selected our department for graduate study upon the advice and recommendation of our alumni. Kinda satisfying to the Old Man.*

After 30 years as head of Biology, I.D. Wilson retired in 1958. Wilson's energies and leadership had been far-reaching. He had maintained contact with many of the Biology graduates, as well as faculty and staff. Over 100 letters wishing I.D. well in retirement were sent. The letters include President Walter Newman, Bob Ross, Perry Holt, A.D. Massey, and John Amos. Lucy Lee Lancaster wrote: "Now to add a word of gratitude for all the pleasant Christmas letters I have received from you by virtue of being a former student in the Biology Department. And last, but not least, I want to say 'thank you' for your various acts of kindness to the Lancaster family during the years when you were our good neighbor. May you find 'good neighbors' everywhere you go." (December 9, 1957).

Following Wilson's retirement, **Frederick Orcutt** became acting head, later to be appointed head. In 1959, three new departments-- Entomology, Forestry & Wildlife, and Veterinary Science--were created out of the Department of Biology, which had become too unwieldy under Wilson's administration. So, by 1959, biological sciences in the broad sense occupied numerous departments under the Agriculture umbrella.



An important development to the infrastructure of the campus began during the mid 1950's with the establishment of the Blacksburg-Christiansburg Water Authority. This paved the way for V.P.I. to expand from its previously limited well water supplies to a pipeline system bringing unlimited clean water from the New River to campus by 1960.

In 1961, The School of Applied Sciences and General Studies was established incorporating the Department of Biology, as well as several liberal arts and other sciences which previously had been affiliated with Agriculture. In 1964, that School was renamed The College of Arts and Sciences. Orcutt resigned in 1966, and **Stuart Neff** was appointed interim during the search for a new head. For several decades much of biology teaching and research had been located in Price Hall. T. Marshall Hahn had become the new president of V.P.I. in 1962 of the nearly all-male university. Hahn changed that situation in 1964, by making the Corps of Cadets optional and eliminating the 1944-64 connection with Radford Women's College. These changes opened up this Land Grant and State University to a vast increase in applications, especially by women. These changes and the favorable climate for funding education and new buildings by the Virginia legislature propelled the University into a rapid growth phase, both in size and quality. The search for a new head of Biology led to a prominent professor at the University of Maryland.

**Robert A. Paterson** had coordinated the enormous American Institute of Biological Sciences meeting in 1966 on that campus, so in 1967, Paterson moved to V.P.I. as the new Department of Biology head and brought with him a plant biochemist named **Ernest R. Stout**. The biology faculty were located in Price Hall, including such memorable persons as **Robert Ross, Perry Holt, Robert Benoit, Alan Heath, Noel Krieg, Harrison Steeves, and David West**---in all, 17 biology faculty, counting Stout and Paterson. Before Paterson stepped aside in 1979, the Department of Biology had nearly tripled in size to 49 faculty and had moved into a new building. Derring Hall opened in 1969. In parallel with student enrollment increases, new faculty had been hired. **John Cairns** arrived in

1968, **Bruce Parker** in 1969, and **Orson Miller** with four others in 1970, the same year that V.P.I. became Virginia Polytechnic Institute & State University. In just 12 years, Paterson had hired the above mentioned and **Curtis Adkisson, Robin Andrews, Ernest Frederick Benfield, Arthur Buikema, Donald Cherry, William Claus, Jack Cranford, Klaus Elgert, Joseph Falkinham, Albert Hendricks, Thomas Jenssen, Anne McNabb, Duncan Porter, Charles Rutherford, Stephen Scheckler, George Simmons, David Stetler, Bruce Turner, John Tyson, Jackson Webster, Allan Yousten**, plus several others who moved on to other places. Most of the new hires were as 9 month appointments in contrast to earlier ones which often were for 11-12 months (9 academic and 2-3 months funded by the Experiment Station).



*Biology faculty members meet with Dean of Research Randal Robertson, circa 1975. L to R: Ken Dixon, Albert Hendricks, Fred Benfield, Robert Paterson, Randal Robertson, and John Cairns*

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The high diversity in this large faculty's research and teaching interests was reflected in the three weekly seminars: Botany, Microbiology, and Zoology. Paterson brought to the Biology Department active researchers and talented teachers covering a great diversity of areas. He established the Executive-Personnel Committee with its democratic peer-evaluation system, which became a model for other departments on campus. Paterson was an excellent listener, altruistic, a gentle but firm persuader. With his fingers on the pulse of the department, he worked to establish a strong faculty.

During this period, the department's reputation grew nationally. The number of biology majors increased until the department became one of the largest on campus and also one of the most cramped for space. Paterson weeded out occasional faculty who did not fit the department's new standards. During the early 1970's, Virginia Tech faculty often met other scientists at national meetings who would read their name tags, then ask: "Virginia Polytechnic Institute? Where is it?" This type of questioning disappeared by the end of the 1970s as our biologists became nationally recognized. Aided by growth on this campus, Paterson ushered in a new era. For the most part, the faculty were content to remain despite the limited resources, but they were not complacent.

(Part III of "The History of Biological Sciences", will appear in our next newsletter.)



Professor Emeritus  
Bruce Parker

## American Society for Microbiology Virginia Branch Meeting 2011

The 2011 ASM Virginia Branch meeting was held at Virginia Tech on November 5 and 6, 2011. Five biological sciences faculty members acted as hosts for the meeting: **Ann Stevens** (Professor), **Birgit Scharf** (Assistant Professor), **David Popham** (Professor), **Florian Schubot** (Assistant Professor), and **Stephen Melville** (Associate Professor). Sessions and presentations were held at both the Virginia Bioinformatics Institute and the Life Sciences I Building.

Dr. James M. Tiede of Michigan State University, a National Academy of Sciences member, was invited by the Virginia Tech Microbiology Club, and presented a VT Life Sciences Seminar titled "The catalysts under our feet as unveiled through metagenomics." Dr. Marvin Whitely of the University of Texas was the ASM Branch Lectureship Speaker, presenting a talk titled "Microbial Facebook: Probing Bacterial Social Networks."

Presentations were given by students from universities across Virginia, including Virginia Tech, University of Virginia, Virginia Commonwealth University, Old Dominion University, and Norfolk State University. **Robert Cory Bernhards**, a graduate student in the lab of Florian Schubot, won the award for "Best Student Presentation"; **Casey Bernhards**, of Melville's Lab, won an honorable mention for her presentation.

The 2012 AMS Virginia Branch Meeting will be held at Old Dominion University.

## Alumni News



**Dr. Jason E. Bond** is a professor of biology and director of the Biodiversity Learning Center at Auburn University. When he was an associate professor with the Department of Biology at East Carolina University, he discovered the trapdoor spider *Myrmekiaphila neilyoungi*.

He went to undergraduate school at Western Carolina University, majoring in biology in 1993. He then went to receive his M.S. in Biology (1995) and Ph.D. in Evolutionary Systematics and Genetics (1999) from Virginia Tech, under advisor **Brent Opell**, professor of biological sciences.

On August 6, 2008 Bond appeared on The Colbert Report, where he named a spider the *Aptostichus stephencolberti* after host Stephen Colbert.

Bond's current research focuses on questions of evolutionary diversification at a number of hierarchical levels among arachnids and myriapods. Dr. Bond was the invited keynote speaker at the 2012 VT Biological Sciences Research Day.



**Dr. Shawn W. Semones** is the Director of Research and Development at Novozymes in Salem, VA. Novozymes is a biotech company with a strong focus on enzyme production that markets over 700 biotechnology products in 130 countries.

Semones was born in Roanoke and earned his B.S. and M.S. in Biology from Virginia Commonwealth University in 1994. His thesis work at VCU focused on ecology of barrier islands, specifically the Virginia barrier islands. Semones began a career in Roanoke after obtaining his M.S., but by 1995 had decided to further his education. He completed his Ph.D. in the lab of **Erik Nilsen**, professor of biological sciences. His dissertation title was "Inhibition of canopy tree seedlings by thickets of *Rhododendron maximum* in an eastern deciduous forest."



## New Integrated Science Curriculum

**Jill Sible** (Professor and Associate Dean) and **John Tyson** (University Distinguished Professor) are part of a team that launched the College of Science's new Integrated Science Curriculum, which successfully started with its inaugural class in the fall 2011 semester. A unique classroom environment used problem-based exercises in a teamed fashion to master interdisciplinary concepts. Physics, biology, mathematics, and chemistry were integrated to understand the fundamental principles in emerging technologies. The capstone event included a team presentation describing recent advances in interdisciplinary concepts ranging from gene delivery to solar energy. The interdisciplinary students with majors in biology, physics, mathematics, and chemistry seamlessly integrated diverse concepts to tackle complex questions that face society today. The Integrated Science Laboratory, which involved modules in cell biology, chemical kinetics, physics, statistics, and photosynthesis, exposed students to state-of-the-art instrumentation and diverse faculty from across the College of Science, resulting in a community of students who are dedicated to an interdisciplinary strategy for learning science.



As a part of the College of Science's sustained initiative to foster interdisciplinary curriculum and emerging interdisciplinary degrees and programs, the Academy of Integrated Science recognizes faculty who have significantly contributed to the design, implementation, and teaching of courses in the integrated science curriculum and these emerging interdisciplinary degrees. The Academy provides a forum for this community of scientists who are dedicated to the interdisciplinary education of our future scientific leaders.

Modern science is becoming increasingly interdisciplinary and collaborative in nature. College of Science students involved in the program will be introduced from day one to critical new ways of thinking about and conducting basic science. Learning the foundations of physical, mathematical and life sciences in an integrated, active-learning classroom will produce students that are better prepared not only for the traditional majors in the College of Science, but also new interdisciplinary majors that are currently under development (nanoscience, neuroscience, computational science, systems biology). In addition to meeting disciplinary learning outcomes in biology, chemistry, mathematics, computer science, physics and statistics, ISC scholars will develop skills in teamwork, problem solving, integration, and communication. The pilot of the ISC will be taught by a team of three faculty members per semester. Participating students will therefore enjoy an incredible 7:1 student:faculty ratio for this experience. Moreover, students will be learning with a group of peers who share their passion for and talent in science and math.

The Integrated Science Course will consist of a two-year, double-effort course sequence (6 hours lecture + 6 hours lab, 8 credits per semester for 4 semesters = 32 credits total) that will cover the fundamentals of college-level chemistry, physics and biology, integrated with each other and with the mathematical sciences (calculus, linear algebra, differential equations, probability and statistics, numerical methods and programming skills). Students who finish the 32 credit sequence will be at least as well prepared for further study as students who take traditional courses in: Principles of Biology (8 credits), General Chemistry (8 credits), Calculus-based Physics (8 credits), Differential and Integral Calculus (8 credits), Elementary Statistics (3 credits) and Introduction to Computer Science (3 credits). *(continued on page 8)*



Professor of Biological Sciences **Jack Webster** has received two major awards for outstanding teaching this year: the university's 2012 William E. Wine Award, and the College of Science's Certificate for Teaching Excellence.

The William E. Wine Achievement Awards were established in 1957 by the Virginia Tech Alumni Association in memory of William E. Wine, Class of 1904, who was a former rector of the board of visitors and alumni association president. Following a college-level selection process of candidates nominated by students, faculty, and alumni, each college may put forth one nominee. Three faculty members are selected to receive this teaching award by a committee representing all eight colleges at the university. Each Wine Award winner is automatically inducted into the Academy of Teaching Excellence.

The College of Science's Carroll B. Shannon Certificate of Teaching Excellence is bestowed annually to faculty members who demonstrate outstanding teaching skills and methods, as well as dedication to learning.

In his 36 years in the Department of Biological Sciences, Webster has established himself as an exceptional teacher-scholar. According to the department's honorifics committee members and department head **Brenda Winkel**, students see that Webster fosters a high degree of student involvement in both teaching and research. "Most remarkable is that one in five students who have written comments on their evaluations over the years have noted that he is one of the best teachers they have had Virginia Tech," stated the committee.

Congratulations, Dr. Webster!



**Lisa Belden**, Associate Professor of Biological Sciences, has also received a 2011 Certificate of Teaching Excellence from the College of Science, in recognition of her exceptional contributions to the department's teaching mission. This has included mentoring more than 60 undergraduates in her research laboratory in just seven years.

Congratulations, Dr. Belden!

## Grants, Awards, and Other News

**The 9th Annual Biological Sciences Research Day was held February 25, 2012. Congratulations to the winners listed below!**

- Best Oral Presentation: **Revathy Ramachandran** (Stevens Lab)
- Best Poster, Evolution, Ecology & Behavior: **James Skelton** (Brown Lab)
- Best Poster, Molecular, Cell, Developmental, and Computational Biology: **Bin He** (Cimini Lab)
- Best Poster, Microbiology/Immunology (tie): **Bianca Baker** (Li Lab) and **Brad Howard** (Lawrence Lab)

**Congratulations to the following winners of 2012 Biological Sciences Departmental Awards:**

- Outstanding Teaching Awards: **Dana Hawley** (Assistant Professor) and **Richard Seyler** (Instructor)
- Outstanding Research Awards: **Liwu Li** (Professor) and **Ignacio Moore** (Associate Professor)
- Outstanding Service Awards: **Karen Fraley** (Undergraduate Office Manager) and **Birgit Scharf** (Assistant Professor)
- Outstanding Undergraduate Advisor: **Jill Sible** (Professor and Associate Dean of the College of Science)
- Outstanding Graduate Advisor: **Jeff Walters** (Harold Bailey Professor and Graduate Director)

**George Simmons**, Alumni Distinguished Professor Emeritus, was chosen as "Most Influential Professor" by the 2012 graduating class of biological sciences majors. Dr. Simmons was also named the Virginia Tech CIDER Teacher of the Week in March 2012.

**Kayvon Izadpanah**, a graduating senior majoring in biological sciences and biochemistry, was recognized as the Virginia Tech Undergraduate Man of 2012.

**Carly Stephens**, a graduating senior majoring in biological sciences, was recognized as the Virginia Tech Undergraduate Woman of 2012.

**Brittany Gianetti**, a graduating senior biological sciences major, received the 2012 Arthur Buikema Outstanding Senior Award.

**Shannon Karinshak**, a graduating senior biological sciences major, received the 2012 Buikema Undergraduate Research Award.

**Stephanie Voshell**, a graduate student in the Hilu Lab, received TWO awards for her excellence in teaching! She received the Virginia Tech Graduate School's 2012 Graduate Teaching Assistant Excellence Award and the Buikema Graduate Student Teaching Award.

**Ivan Tavassoly**, a graduate student in the Tyson Lab, was named the 2012 Virginia Tech Outstanding Interdisciplinary Doctoral Student.

**Adam Altrichter** (Barrett Lab) received the College of Science's 2012 Outstanding Master's Student Award.

Graduate Student **Yan Fu** (Xing Lab) has been featured in the Biophysical Society's "Student Spotlight".

**Years of Service Awards:** Art Buikema (40 years), Khidir Hilu (30 years), Tom Wieboldt (30 years), Annette Fluri (25 years), Debbie Wiley (25 years), David Popham (15 years), Ann Stevens (15 years), Myra Williams (15 years), Steve Melville (10 years), Mike Rosenzweig (10 years)

Associate Professor **Ignacio Moore** and research scientist **Fran Bonier** have received a \$705,000 grant from the National Science Foundation entitled "The role of glucocorticoids in mediating life history tradeoffs."

**Carla Tyler**, Laboratory Specialist (Microbiology Labs) was named the Virginia Tech Staff Member of the Week in January 2012.

**David Mittleman** (Associate Professor, VBI) is co-author of a paper published in February 2012 in *Nature* describing the Drosophila Genetic Reference Panel (DGRP), which provides the highest-resolution view to date of the genome structure and variation in a population of 192 diverse traits. The resource may act as a Rosetta Stone for revealing the genetic basis of traits and disease.

**We're pleased to welcome five new additions to the Biological Sciences family!**

- **Adi Livnat** (Assistant Professor), and wife Kim welcomed daughter Tali Rebecca on December 15, 2011.
- **Carla Finkielstein** (Associate Professor) and **Daniel Capelluto** (Associate Professor) welcomed daughter Sienna Arielle on February 2, 2012.
- **Laila Kirkpatrick** (Laboratory Specialist in the Hawley Lab) and husband Andy welcomed daughter Alyssa on May 1, 2012.
- **Yi Xiao** (Graduate student in the Schubot Lab) and wife Yajuan Chen welcomed daughter Ella on May 8, 2012.
- **Zhaomin Yang** (Associate Professor) and wife Jenny welcomed daughter Jewel "JuJu" on June 8, 2012.

Assistant Professor **Birgit Scharf** is co-author of an article which was cited by *Faculty of 1000*. ("Sinorhizobium meliloti CheA complexed with CheS exhibits enhanced binding to CheY1 resulting in accelerated CheY1 dephosphorylation." *Journal of Bacteriology*, March 2012)

**Ciani Clarke**, a graduating senior in biological sciences, won 2nd place in the undergraduate essay contest at the Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) Conference held in March 2012 in Atlanta.

Graduate students **Matthew Becker** (Belden Lab), **Xing Jing** (Schubot Lab), **Robert Northington** (Webster Lab) and **William Silkworth** (Cimini Lab) received "2010 Assistantships."

Graduate Student **Elan Dalton** (Socha/Moore Labs) received a Multi-Steps IGERT Award from the National Science Foundation.

**Kevin Geyer** and **Jeff Norman**, graduate students in the Barrett Lab, received 2012 NSF Doctoral Dissertation Improvement Awards.

**Linda Villa**, a graduate student in the Finkielstein Lab, was named a Multi-cultural Academic Opportunities Program (MAOP) Graduate Scholar.

**Sharmistha Mitra**, a graduate student in the Capelluto Lab, received the 2012 College of Science Roundtable "Make a Difference" Scholarship.

Graduate student **Nimisha Khanduja** (Kuhn Lab) received a 1st place poster award at the Virginia Tech Graduate Student Research Symposium.

**Bin He**, a graduate student in the Cimini Lab, has received two more recent awards; the American Society for Cell Biology CellDance Public Research Award and a 1st place poster award at the Virginia Tech HNFE/ILSB Research Symposium.

Graduate student **Josh Nicholson** of the Cimini Lab received a 3rd place poster award at the Virginia Tech HNFE/ILSB Research Symposium. Nicholson also had an essay, titled "Collegiality and careerism trump critical questions and bold new ideas: A student's perspective and solution" published in the journal *Bioessays* in February 2012.

**Bonnie Fairbanks**, a graduate student in the Hawley Lab, received an Honorable Mention for a research talk given at the 2012 Mid-Atlantic Ecological Science of America Meeting.

Four undergraduate students majoring in biological sciences have been named Dean's Roundtable Scholars: **Katrina Loncar** (Biological Sciences and Psychology), **Julia Button** (Biological Sciences and Biochemistry), **Aaron Wilson** (Biological Sciences and Chemistry), and **Grace Mullholland** (Biological Sciences and Psychology).

**Deborah Kelly** (Assistant Professor, Virginia Tech Carilion Research Institute) has developed a novel technology platform to peer closely into the world of cells and molecules within a native, liquid environment. Kelly's *affinity capture device*, in combination with high-resolution TEM, helps bridge the gap between cellular and molecular imaging, allowing researchers to achieve spatial resolution as high as two nanometers. An article on her research appeared in the February 2012 issue of *RSC Advances*, an international journal of the Royal Society of Chemistry of London.



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## Integrated Science Curriculum *(continued from page 6)*



However, the Integrated Science Curriculum is not just a repackaging of these courses. The ISC will expand the scope of traditional sciences to encourage students to apply knowledge and skills to important societal problems (food, energy, health, environment) and explore new approaches to common questions about nature and life. ISC students will be exposed to a variety of topics (e.g. organic chemistry and biochemistry, linear algebra, differential equations, numerical methods, stochastic processes) that are not usually covered in introductory courses. In addition, participants will explore the inter-relationships of the sciences in ways that extend beyond current disciplinary course structures. Teamwork, written and oral presentation, and problem-solving will be central to the pedagogy of this course. The laboratory experience will also be closely integrated with the lecture material, while data collection in the laboratory will incorporate statistical and computational methods of data analysis and interpretation. Computer skills and programs (PERL, Matlab, SAS, R) will be effectively applied to natural scientific settings.

ISC is not merely a repackaging of the traditional courses listed above. Nor is ISC intended to be a major. Rather it will be an alternative gateway to participating majors in the College of Science, designed for students who want to study scientific fundamentals in an integrated, active-learning environment atmosphere. Students who complete the ISC will still choose a major field of study and take the standard sophomore-level courses that are foundational to that major (e.g., Organic Chemistry; Genetics; Cell & Molecular Biology; Ecology; Multivariate Calculus).

The inaugural class of ISC scholars were selected by an application and interview process. Students were selected on the basis of academic record (especially in Math and Science) and passions for science and/or math (as judged by the essay and letter of recommendation). Finalists were also interviewed. The following undergraduate majors have agreed to accept the ISC as a substitute for core courses in their program (individual majors may require disciplinary-specific coursework to supplement the ISC): Biological Sciences, Geosciences, Mathematics, Physics, and Statistics.

*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 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.*