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SYNERGY

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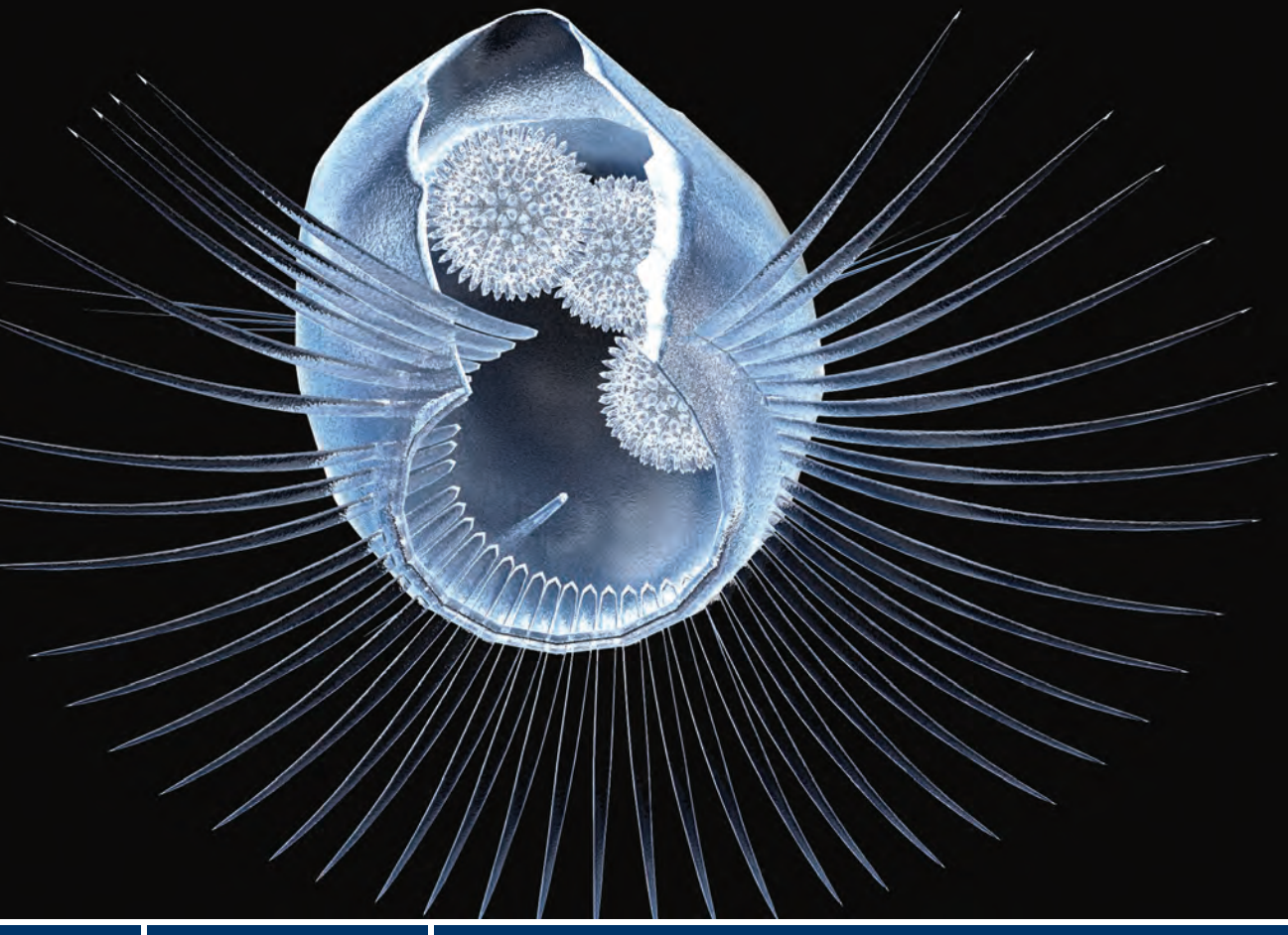
THE UNDISCOVERED—AND VANISHING COUNTRY OF MICROBES 06



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

BUILDING ON SCIENCE: TRANSFORMATION

This September, our students will begin attending classes in UBC's spectacular new Earth Sciences Building (photos linked on page 3). We're immensely proud of our new facility, which will dramatically expand and improve the learning environment for thousands of students taking science classes at UBC and boost our researchers' ability to collaborate across the geosciences.

The opening of ESB coincides with the beginning of my second term as Dean of Science. And as I reflect on what we've accomplished over the past six years, I can't help but be struck by how prominently our alumni and friends have featured in the Faculty's growth.

Five years ago, alumni and student support allowed us to open the Abdul Ladha Science Student Centre, providing our students and the Science Undergraduate Society with dedicated, collaborative study space after many years of—to put it mildly—'less than ideal' facilities (page 23).

We've also accelerated our efforts

NEWS

SUSTAINABILITY

Jellyfish Rising

A bloom of moon jellyfish near Denmark.
Photo: Casper Tybjerg

Jellyfish populations are increasing in the majority of the world's coastal ecosystems, according to the first global study of jellyfish abundance.

In the April edition of the journal Hydrobiologia, UBC scientists examined data for numerous species of jellyfish for 45 of the world's 66 large marine ecosystems. They found increasing jellyfish populations in 62 percent of the regions analyzed, including East Asia, the Black Sea, the Mediterranean, the Northeast United States Continental Shelf, Hawaii and Antarctica.

"There's been anecdotal evidence that jellyfish were on the rise in recent decades, but there hasn't been a global study that gathered together all the existing data until now," says Lucas Brotz, a PhD student with the Sea Around Us Project at UBC and lead author of the study. "Our study confirms these observations scientifically after analysis of available information from 1950 to the present for more than 138 different jellyfish populations around the world."

Jellyfish directly interfere with many human activities—they sting swimmers, clog intakes of power plants, and interfere with fishing. Some species are now a food source in some parts of the world. "By combining published scientific data with other unpublished data and observations, we could make this study truly global—and offer the best available scientific estimate of a phenomenon that has been widely discussed," says Daniel Pauly, principal investigator of the Sea Around Us Project and co-author of the study.

Pauly adds that increasing anecdotal reports of jellyfish abundance may have resulted from an expansion of human activities in marine habitats, so the study also provides a concrete baseline for future studies.

PHYSICS

A First Look At the 'Anti-Atomic Fingerprint'

This March an international team, led by Canadian physicists from UBC, SFU and TRIUMF, used microwaves to manipulate antihydrogen atoms. The findings, published in April in the journal Nature, provide the world with its first glimpse of a so-called "anti-atomic fingerprint."

AND GROWTH, THANKS TO ALUMNI

to transform undergraduate science education thanks to the support of our alumni. Our Carl Wieman Science Education Initiative (page 14) has evaluated and systematically improved almost 50 key undergraduate courses, and the ongoing dedication of faculty has allowed us to enrich learning experiences across our curriculum. Thousands of students are learning more and enjoying more rewarding, relevant classroom experiences as a result.

The vision of our alumni has also enabled us to open a new museum that provides visitors with unique insights into UBC's biodiversity collections and research. Families and school classes can now visit the Beaty Biodiversity Museum (page 10) and connect with the evolutionary biology and ecology research being conducted at UBC.

Often the greatest gifts alumni give us is their expertise and advice. It's been my privilege as Dean to see how the involvement of alumni in Beyond the BSc, department tri-mentoring events, and Women in Science and Engineering (page 16) pay long-term dividends for our students. I'm delighted that those events draw more and more alumni every year.

As I look forward to the next six years—and the UBC Science community collectively looks forward to its next half century—let me take this opportunity to thank you. We couldn't have achieved any of this without you. Thanks to you the future of UBC Science looks very bright indeed!

Antimatter is a staple of science fiction, but it also stands as one of the biggest mysteries of science. Fundamental theories predict perfect symmetry between matter and antimatter, but the glaring absence of antimatter in our universe suggests there might be a difference between the two. Enter microwave spectroscopy, one of the most sensitive techniques for probing the structure of atoms.

"This demonstrates the feasibility of applying microwave spectroscopy to fiendishly difficult-to-handle anti-atoms," says co-author Walter Hardy, a world-renowned expert on microwave spectroscopy from UBC and a member of the ALPHA collaboration at CERN's European Laboratory for Particle Physics. "ALPHA is about to enter an intensive upgrade phase that promises to create an ever-clearer picture of the inner structure of antimatter atoms."

The study involved confining anti-atoms in a magnetic trap and irradiating them with microwaves. Precise tuning of the microwave frequency and magnetic field enabled researchers to hit an internal resonance, kicking atoms out of the trap and revealing information about their properties.

HEALTH

An Immune Cell's 'Internal Guidance' System

UBC researchers have discovered the molecular pathway that enables receptors inside immune cells to find, and flag, fragments of pathogens trying to invade a host.

The discovery of the role played by the molecule CD74 may help immunologists in the investigation of treatments that offer better immune responses against cancers, viruses and bacteria, leading to more efficient vaccines.

"This could ultimately lead to a blueprint for improving the performance of a variety of vaccines, including those against HIV, tuberculosis and malaria," says UBC biologist Wilfred Jefferies, whose lab conducted the study published in Nature Immunology. "This detailed understanding of the role of CD74 may also begin to explain differences in immune responses between individuals, which could impact personalized medical options in the future."

CD74 is an important piece of cellular machinery inside dendritic cells—cells that regulate mammalian primary immune responses. Dendritic cells possess specialized pathways that enable them to sense, and then respond to, foreign threats. Until now, no one has been able to piece together the circuitry that enables a receptor inside the cells to find and "collide" with foreign invaders.

MATHEMATICS

Mathematician Lauded for Education, Outreach Leadership

UBC mathematician Mark MacLean has been awarded the 2012 Pacific Institute for the Mathematical Sciences (PIMS) Education Prize for his efforts in educational transformation, outreach and Aboriginal engagement.

"Mark is an amazing teacher and a gifted educator," says Alejandro Adem, PIMS director. "UBC and the PIMS community are fortunate to be able to count on his leadership and support across a wide variety of educational matters. He's uniquely qualified for this award."

MacLean helped establish UBC's integrated first-year science program—UBC Science One—and has taken on major roles in course development, instructor supervision, tutorial centre management and teaching assistant training. His outreach activities include leadership in the national Euclid Mathematics Contest and teacher professional development in Aboriginal education, in collaboration with PIMS. These activities support high school teachers and students throughout the greater Vancouver area and beyond.

View photos of UBC Science's new Earth Sciences Building, set to become the new home for Earth, Ocean and Atmospheric Sciences, Statistics, the Pacific Institute for the Mathematical Sciences, and the Dean's Office.
science.ubc.ca/synergy

A wave breaking in the intertidal zone, Hopkins Marine Station, California. Photo: Patrick Martone

Seaweed Survival Tactics

UBC botanists have placed seaweed in the underwater equivalent of a wind tunnel to get a better idea of how different types of algae withstand the onslaught of strong waves and currents.

The findings, published in the American Journal of Botany, show that bladed and branched seaweeds take different approaches to surviving stormy waters—some reducing their surface area in the face of increased turbulence, others actually changing shape to cope.

Researchers, led by UBC botanist Patrick Martone, collected fronds from six different species of algae (four branched, two bladed) along the intertidal zone of the central Californian coast. They placed them in a recirculating water flume and measured the drag they experienced and the changes in shape and size they underwent under 15 different rates of water flow.

"Many animals can run and hide when storms roll in and the waves increase," says Martone. "But seaweeds don't have that option. They just have to hold on tight and face the waves head-on."

While all six species of seaweed underwent severe reconfiguration as water velocity increased—thus limiting the drag they would otherwise experience if they were rigid—the two types of algae accomplished this in slightly different ways.

"Unbranched algae seem to be shape changers, reducing drag primarily by folding and collapsing in flow," notes Martone. "Certain branched algae, on the other hand, are area reducers, compensating for drag-prone shapes by reducing frond size through branch reorientation and compression."

Measurements extrapolated out from lower speeds did not always match those observed at higher speeds, making it tricky to predict what would happen at higher water velocities.

HEALTH

Linking Antibiotics to Childhood Allergic Asthma

New research from UBC microbiologists indicates that widely used antibiotics may increase the incidence and severity of allergic asthma in early life. The study, published in March in EMBO Reports, showed that certain antibiotics that affect intestinal bacteria also had a profound impact on allergic asthma.

"It's long been suspected that kids exposed to more antibiotics—like those in developed countries—are more prone to allergic asthma," says UBC microbiologist Brett Finlay. "Our study is the first experimental proof that shows how."

Finlay's team at UBC's Michael Smith Laboratories, and collaborators led by Kelly McNagny at the Biomedical Research Centre, examined how two widely used antibiotics—streptomycin and vancomycin—affected the bacterial "ecosystem" in the gut. They found that vancomycin profoundly alters the bacterial communities in the intestine and increases severity of asthma in mouse models. "Modern societal practices, such as improved sanitation methods and widespread antibiotic use, are causing the disappearance of ancestral species of bacteria in our gut that may be critical to a healthy immune system," says Finlay.

The same antibiotics do not impact the susceptibility to asthma in adult mice, indicating that early life is a critical period of establishing a healthy immune system.

SUSTAINABILITY

An Index for Fisheries Conservation Risk

UBC researchers have identified conservation "hot spots" around the world where the temptation to profit from overfishing outweighs any national appetite for conservation. Combining economic outlook and fisheries population growth rates for all countries currently reporting ocean fish catches, UBC fisheries researchers William Cheung and Rashid Sumaila developed a conservation risk index to reveal the economic-conservation trade-offs of fishing.

Areas with the highest risk index—those most biologically and economically vulnerable to overfishing—include the northeastern coast of Canada, the

Pacific coast of Mexico, the Peruvian coast, the south Pacific offshore of New Zealand, the southern and southeastern coast of Africa and the Antarctic region. "This index is a guide for determining the appropriate conservation and fisheries management policy for each region," says Cheung, who presented his research in February at the Annual Meeting of the American Association for the Advancement of Science held in Vancouver.

ADVANCED MATERIALS

Ultra-Fast Laser Pulses Shed Light on Elusive Superconducting Mechanism

An international team that includes UBC physicists has used ultra-fast laser pulses to identify the microscopic interactions that drive high-temperature superconductivity. In the experiment, outlined in the journal Science, electrons in a prototypical copper-oxide superconductor were excited by extremely short—100-femtosecond (0.0000000000001-second)—laser pulses.

As the material's electrons relax back to an equilibrium state, they release their excess energy via deformation of the superconductor's atomic lattice (phonons) or perturbation of its magnetic correlations (spin fluctuations).

The researchers were able to capture very fine-grained data on the speed of the relaxation process and its influence on the properties of the superconducting system, showing that the high critical temperature of these compounds can be accounted for by purely electronic (magnetic) processes.

"This new technique offers us our best window yet on the interactions that govern the formation of these elusive superconducting properties—both across time and across a wide range of characteristic energies," says UBC associate professor Andrea Damascelli, Canada Research Chair in Electronic Structure of Solids.

BIODIVERSITY

Picky Females Good for Species Diversity

Picky females play a critical role in the survival and diversity of species, according to a study published in Nature by researchers from UBC and colleagues from the International Institute for Applied Systems Analysis.

To date, biodiversity theories have focused on the role played by adaptations to the environment—the species best equipped to cope with a habitat wins out. The new study presents the first theoretical model demonstrating that selective mating alone can promote the long-term coexistence of species that share the same ecological adaptations and readily interbreed—frogs, crickets, grasshoppers and fish, for example.

"The focus on ecological adaptation has failed to explain much of the biodiversity we see right before our eyes," says the study's first author, Leithen M'Gonigle, a former PhD candidate at UBC.

"Our model shows that species can stably coexist in the same habitat as long as two simple conditions are met. First, the distribution of resources they use must not be uniform, so that groups of females with different mate preferences can occupy different resource hot spots. Second, females must pay a cost for being choosy, through reduced survival or fecundity," says M'Gonigle.

Says UBC zoologist and co-author Sarah Otto, Canada Research Chair in Theoretical and Experimental Evolution: "By being picky, females almost always suffer a cost, because they spend energy either to find a preferred mate or to avoid an undesirable one."

Stephen Withers, Chemistry

HONOUR ROLL

External Recognition

Fellow, Royal Society, United Kingdom
Stephen Withers, Chemistry

Member, American Academy of Arts and Sciences
Dolph Schluter, Zoology

Fellow, Royal Society of Canada
Patrick Keeling, Botany
Wayne Maddison, Zoology

André-Aisenstadt Prize, Centre de Recherches Mathématiques
Young-Heon Kim, Mathematics

ERW Steacie Memorial Fellowship, Natural Sciences and Engineering Research Council of Canada
Mark MacLachlan, Chemistry

Medal, Chemical Institute of Canada
Raymond Andersen, Earth, Ocean and Atmospheric Sciences; Chemistry

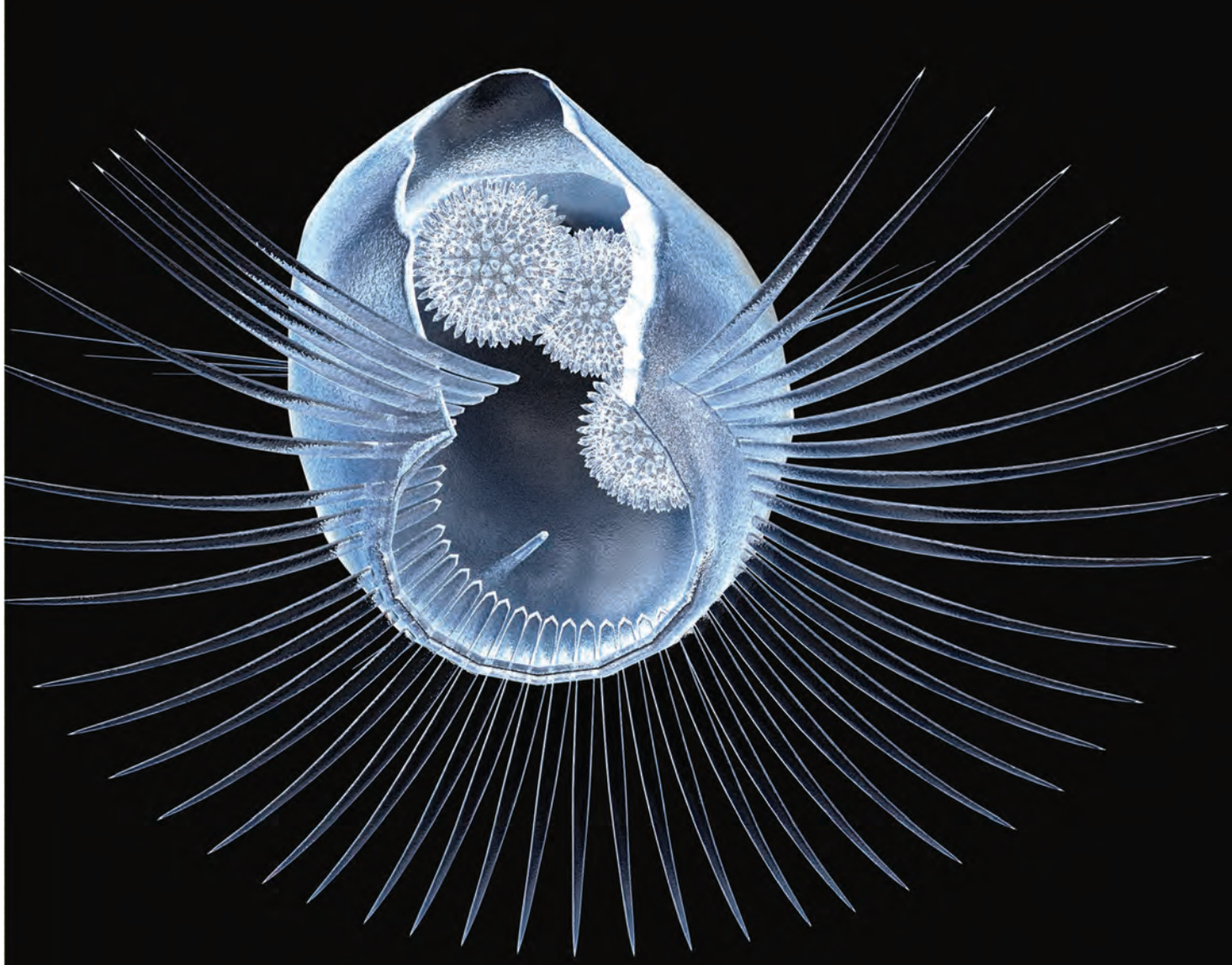
Sloan Research Fellowships, Alfred P Sloan Foundation
Young-Heon Kim, Mathematics
Andrew Warfield, Computer Science

Prize Medal, Society for General Microbiology
Julian Davies, Microbiology and Immunology

Fellow, American Meteorological Society
Roland Stull, Earth, Ocean and Atmospheric Sciences

Medal, Canadian Association of Physicists
Douglas Bonn, Physics and Astronomy
Gordon Semenoff, Physics and Astronomy

Listen to researcher Lindsay Aylesworth discuss her work with UBC's pioneering marine conservation initiative Project Seahorse. **science.ubc.ca/synergy**



THE UNDISCOVERED —AND VANISHING— COUNTRY OF MICROBES

By Margaret Polanyi

Patrick Keeling hunts and studies protists—sophisticated, mostly single-celled microbes that have oversized impacts on ecosystems, natural cycles and human health. They are also disappearing, and we don't really know what we're losing.

"Microbiologists are today doing for biology what Copernicus did for cosmology. We're removing ourselves from the centre of the universe."

– Patrick Keeling

In the ocean off Australia's east coast lies one of the world's greatest playgrounds for sea creatures, humans and micro-organisms alike. The Great Barrier Reef and the currents that swirl around it are teeming with something known as protists: eukaryotic organisms (comprised of cells that have a nucleus) that are neither animal, plant or fungus.

"They're incredibly complex and beautiful organisms with amazing shapes, symmetries and behaviours," says Patrick Keeling, a biologist at UBC who studies the early evolution of these diverse cells.

So it's not surprising that when he travelled to a meeting in Australia, Keeling packed a wetsuit and microscope. The objects of his fascination are generally too small to see with the naked eye, but they are ubiquitous.

"They're in our bodies, the soil, the lakes and rivers, the air," says Keeling. "They get into every single ecosystem imaginable. If we didn't have them around, our ecosystem would collapse." Protists take up carbon dioxide from the Earth's atmosphere and release oxygen. They pump essential nutrients into the water and play an important role in the food chain. They are integral to many industrial processes.

Protists are the most varied and largest group of eukaryotes, yet until recently, most of the diversity of protists remained undiscovered. "For most of human history, we didn't even notice that they existed," says Keeling.

One of the reasons? Studying protists is complicated. "When you study giraffes, you can go out and find a giraffe. But if you're studying microbes, the cell and organism are the same thing, so you have to work at the cellular level." The usual way to study cells has involved growing large numbers from a single cell. But most protists can't easily be cultivated in a Petri dish because it's almost impossible to mimic the myriad and complex environments needed.

However, thanks to recent technological advances, we can now meet protists face to face. Breakthroughs like single-cell genomics and high through-put DNA sequencing are providing a new level of insight into their world. "We can now sequence whole genomes from a single cell that can't be grown in a lab," says Keeling, who heads the Integrated Microbial Biodiversity program of the Toronto-based Canadian Institute for Advanced Research (CIFAR), where he collaborates with scientists from around the world to contribute new knowledge to this field.

And as molecular techniques have advanced, Keeling has made exciting discoveries. Working with Dalhousie University researcher and fellow CIFAR Scholar Claudio Slamovits, he found a marine protist known as Oxyrrhis marina that robs its prey of a gene that promotes photosynthesis. It seems the predator may be using the stolen gene to generate energy from sunlight–or using sunlight to digest its food. "That would be a novel use of light as an energy source," says Keeling.

Right now, his lab is puzzling over a curious relationship between protists and bacteria that live together in the guts of wood-eating insects. The bacteria coat the protists "like a rum ball," says Keeling, who theorizes "that they must be exchanging some type of nutrient, that they have some co-operative agreement."

As new protists, lineages and relationships are identified, Keeling and colleagues are contributing their findings to the Tree of Life Web Project, hosted by the University of

Patrick Keeling is a professor in the UBC Department of Botany. He is director of UBC's Centre for Microbial Diversity and Evolution, a member of the Beaty Biodiversity Research Centre, a fellow of the Canadian Institute for Advanced Research, and a Michael Smith Foundation for Health Research Fellow. Research in this article is supported by the Tula Foundation.

Oxyrrhis marina robs its prey of a gene that promotes photosynthesis.
Image: Patrick Keeling

Arizona College of Agriculture and Life Sciences and the University of Arizona Library. This is a massive repository for all scientific knowledge about the diversity, evolutionary history and characteristics of every species and significant group of organisms on Earth, living and extinct.

The tree is looking very different these days. "Fifty years ago, we drew the tree with animals and plants as the two largest parts. The protists were somewhere at the bottom," explains Slamovits. "Now, it's the opposite. Animals are a tiny branch and so are plants. And they are part of a huge bush with thousands of branches and leaves where almost everything is protists."

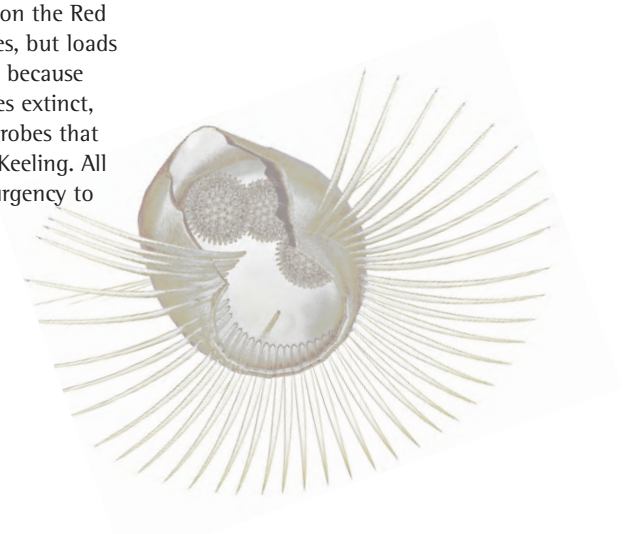
"Microbiologists are today doing for biology what Copernicus did for cosmology," says Keeling. "We're removing ourselves from the centre of the universe."

Studying protists can also shed light on the origin of diseases. Some cause human infections, such as malaria, while others lead to diseases that affect poultry, cattle and fish. Just a few years ago, a startling discovery by Keeling's team and Czech CIFAR researchers connected malaria and the algae responsible for toxic red tides to a common ancestor.

There's still much to learn about microbial diversity—even as human activity threatens it. Keeling cites a Dalhousie study that used oceanographic data to show that microbial diversity has been declining at about one percent each year for the last 100 years. "If you do the math, the level of diversity comes out to about half of what it used to be."

Coral bleaching, which is occurring along segments of the Great Barrier Reef, is a vivid symptom of some of the environmental stresses that are impacting protists and the larger scale systems that host them. Photosynthetic protists are ejected from coral when coral cells are under stress from changes in ocean temperature, water chemistry and other factors. The coral loses nutrients and colour provided by the symbiotic relationship with protists, and the protists lose habitat.

"There are no protists on the Red List of Threatened Species, but loads are probably endangered because every time an animal goes extinct, there are perhaps 20 microbes that go extinct with it," says Keeling. All of which adds an extra urgency to this research.



Adapted from Reach Magazine, Winter 2012, courtesy of the Canadian Institute for Advanced Research.

Image: Martin Dee

Regenerative Sustainability: From Damage Control to Improving the Environment

By John Robinson, executive director of the UBC Sustainability Initiative and professor with the Institute for Resources, Environment and Sustainability. In May, Robinson was named Environmental Scientist of the Year by the Royal Canadian Geographical Society.

Few people now disagree that humanity faces some serious environmental, social and economic challenges, which, for better or worse, need to be addressed now and in the coming decades. One fairly influential school of thought argues that the underlying cause of sustainability problems of all stripes is unsustainable rates of material consumption, sometimes called over-consumption. If so, the solution must lie in reducing such consumption.

This approach suggests that we must ultimately learn to cut back significantly—to change our values, lifestyle and behaviour so as to use less 'stuff.' Where increased human activity is required, the goal must be to reduce the negative impact of such activity and to do less damage. In other words, human activity is seen as essentially negative in terms of its impact on the planet and on (most) people. This view holds that there are limits to growth and we must learn to stay within those limits.

This view of the world has been the subject of criticism from what has been called the cornucopian side of the ledger, which disagrees that such limits exist. However, I want to suggest a different idea altogether—one that accepts the view that sustainability problems are real and pressing, and are the fundamental challenge faced by humanity in this century—but proposes a different route to addressing them.

This route—which we call the 'new sustainability agenda'—focuses on what Ray Cole of UBC's School of Architecture and Landscape Architecture and his colleagues call "regenerative design." This approach looks at how buildings and other systems can be regenerative in the sense of producing net benefits to both human and natural systems. The question this approach must answer is: Can our activities actually improve environmental quality and human well-being?

To the extent that the answer is yes, the implications are surely profound. If human activity can be regenerative, then it need not necessarily be minimized. Then the focus shifts from reducing harm to improving benefit. The goal is not simply to approach net zero impact, but to reach net positive impact. The whole mindset changes from damage limitation to improving environmental and human conditions.

I have described this agenda in terms of a question. We don't know yet how regenerative, over what time frames and within what system boundaries our human-built infrastructure and human-made processes can be. It may be that the potential is limited to certain kinds of activities, which make up just a small part of overall human activity. But certainly this question is worth posing.

This is the research agenda for the Centre for Interactive Research on Sustainability (CIRS), which opened at UBC in November 2011. In fact, the CIRS building has been designed to be net positive in seven ways: four environmental and three human. The 60,000-square-foot building will reduce campus energy use and carbon emissions, improve the quality of the water flowing through our site, and sequester more carbon in the building than all the carbon emitted in building it and supplying it with materials. On the human side, CIRS is intended to make its inhabitants healthier, more productive and happier through better lighting and ventilation systems.

It will be a few years before we know if and how we've succeeded in reaching these net positive goals. But we think this represents an exciting research agenda for sustainability, one that offers the promise of being much more inspiring and motivating than the prevalent "sacrificial" approaches.

Eat or Be Eaten

Photo: Brad Hill

A dramatic predator–prey photo exhibit and self-guided tours of BC's edible plant life highlight a "feast" of summer programming at UBC's Beaty Biodiversity Museum and at the Botanical Garden.

Perched atop the food chain—enjoying hothouse tomatoes all year round—humans have evolved a rarified relationship with food. But for other mammals, birds, fish, insects and even plants, the environment is still intimately tied to finding sustenance and surviving predator–prey relationships.

Over the summer, new programming at the UBC Botanical Garden and the Beaty Biodiversity Museum explores the origins and diversity of human food, and the drama of predator–prey relationships in the wild.

'Feast' at the Beaty Biodiversity Museum

Feast presents an intimate look at animals hunting, fishing and feeding in the wild, all through stunning photographs by internationally acclaimed photographer Brad Hill. Whether in the air, on land or in water, Hill meets the challenge of photographing wild and unpredictable animals, capturing one of their most fundamental behaviours.

Complementary programming explores the diversity of predator–prey relationships. Interactive guided tours will take visitors on a journey, through amazing stories of survival and hands-on activities with museum specimens, to discover the many different ways plants, animals, fungi and microbes nourish themselves and avoid being devoured.

Owls, for instance, are amazing predators of the nighttime sky. An activity with the museum's collection of birds will separate the truth from the myths about owls and will explore the incredible adaptations that make them master predators. The museum's Discovery Lab will also showcase specimens of both predators and prey that exhibit amazing adaptations. Other themes are explored through craft activities, puppet shows and scavenger hunts.

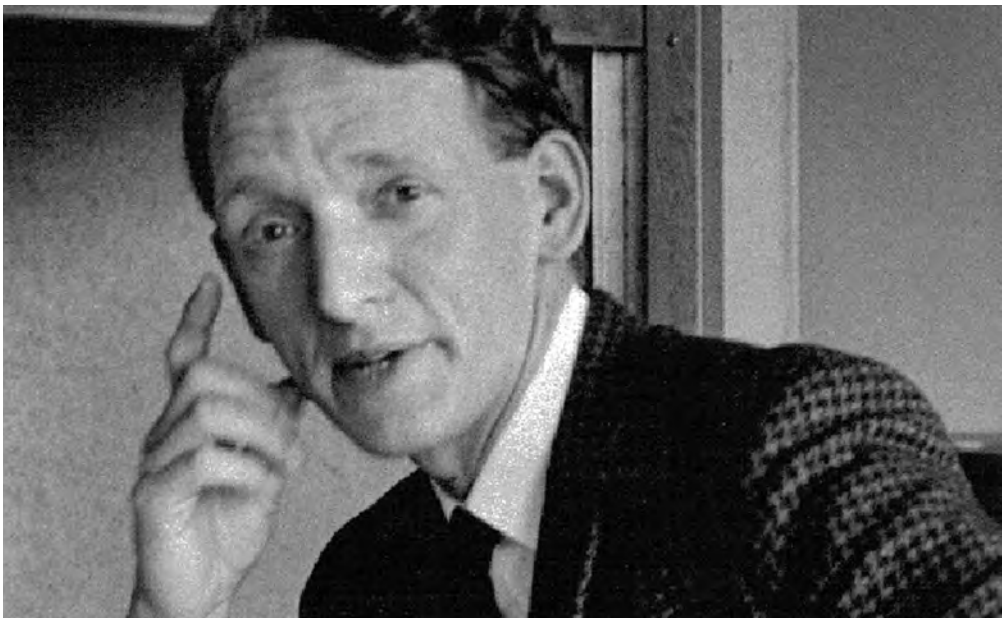
A Garden Salad: Edible Biodiversity at UBC Botanical Garden

Throughout the summer, UBC Botanical Garden celebrates the origins and diversity of human food. A new self-guided tour leads visitors to edible plants in the garden to learn about uncommon vegetables, heirloom varieties and top agricultural crops of the world. Participants will discover plants that belong to traditional First Nations diets and wild edible plants, and study the wild relatives of agricultural plants in our food system. The tour will also discuss how some of these wild plants became major fixtures on our dinner plates.

Families with children may enjoy embarking on a scavenger hunt to discover the amazing diversity of edible plants. They can uncover which parts of plants we eat, hunt for weird-looking vegetables and learn the importance of bees in food production.

Feast, a predator-prey themed photo exhibit at the Beaty Biodiversity Museum, runs through July 22, 2012. The Botanical Garden's edible biodiversity tour runs all summer long.

For details, visit:
botanicalgarden.ubc.ca
beatymuseum.ubc.ca



Remembering a Chemist Iconoclast

UBC chemist Neil Bartlett (1938 – 2008) never won a Nobel Prize for his discovery of the first noble gas compound in 1962. But his legacy is secure, and this spring the Department of Chemistry brought together alumni and friends to celebrate his achievement.

By the time Neil Bartlett arrived at UBC in 1958 from his native England, the world of chemistry had pretty much reached a consensus: noble gases couldn't form compounds. With a full outer coating of electrons—a valence shell—the gases were thought to be just too chemically stable to be reactive.

Several prominent chemists had already tried and failed to create the reaction that would four years later make Bartlett famous. In fact, most researchers interested in the field "did the sensible thing and found another project," jokes Jack Passmore, a PhD student under Bartlett at the time.

But Bartlett, who had conducted some of his first experiments at age 12 and had constructed a makeshift chemistry lab in his parent's home as a teen, wasn't easily dissuaded. Bartlett's new post at a young university on the west coast of Canada gave him the opportunity to explore what he was most interested in.

"Neil even had difficulty in finding the starting materials to begin his experiments but wasn't deterred," recalls Bartlett's first PhD student Derek Lohmann. "He persevered, and upon obtaining the required materials he didn't wait, but carried out the experiment that evening. This was typical of his approach to research."

Working late into the night on March 23, 1962, Bartlett mixed xenon gas—a noble gas—with platinum hexafluoride and obtained a solid, xenon hexafluoroplatinate. The simple experiment proved to the world that the noble gases were not, in fact, inert. A new field of chemistry was born and textbooks had to be rewritten.

To internationally renowned inorganic chemist Herbert Roesky, the elegant solution was a perfect reflection of the man. "Neil could combine beauty and science. He followed it through his PhD to the end of his career, and this is what makes him so famous, even without a Nobel Prize."

Recalls Passmore, "Neil was persistent. He didn't give up, he would always have another 'Plan C' prepared. He was a superb experimentalist, which is completely critical in this line of work. He could make connections and draw things together and create meaning out of things."

While Bartlett's discovery would go on to change the face of chemistry, the immediate reaction was skepticism. The young researcher initially had a difficult time convincing other scientists that he had been able to create the new compound. But Bartlett's findings were eventually verified and accepted by the scientific community, and his legacy was secured.

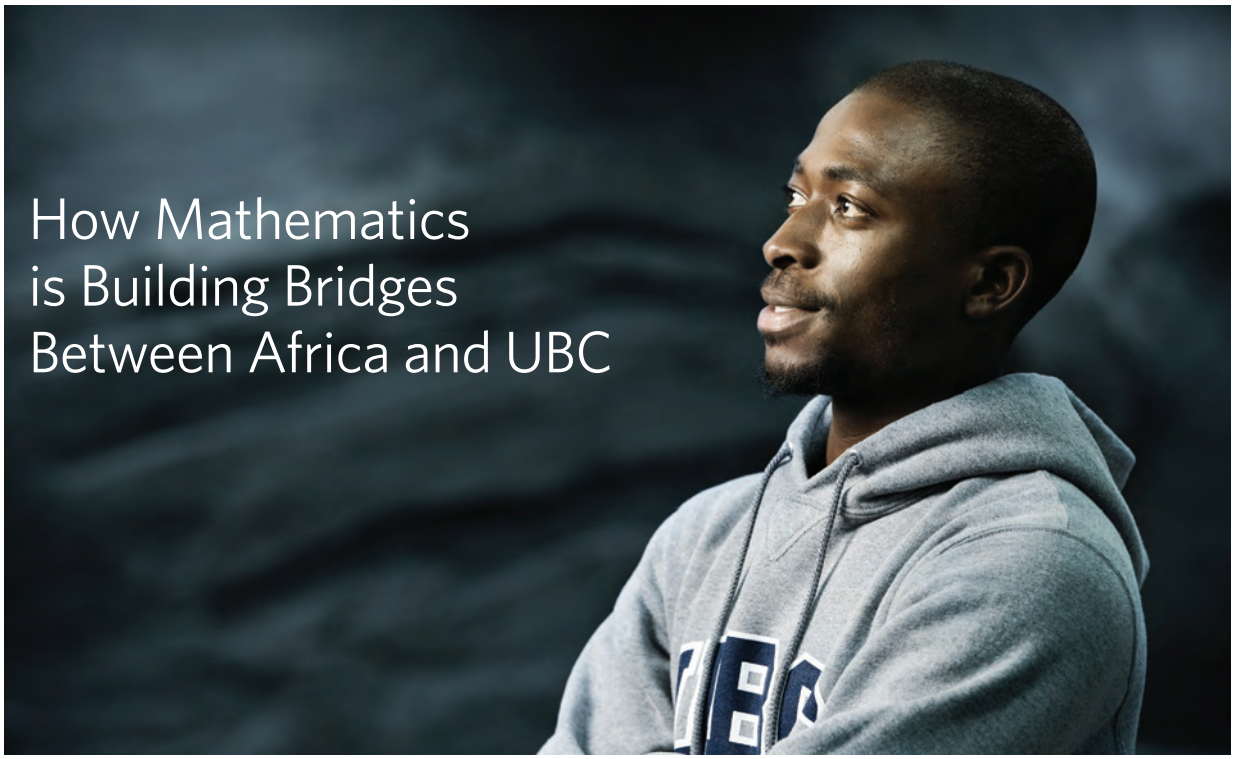
"What is the name of the last Nobel laureate in Chemistry?" Roesky asked a crowd of more than 100 friends and alumni of the department gathered at UBC this March to commemorate the 50th anniversary of the discovery. Three individuals in the audience raised their hands before Roesky, brandishing a chemistry textbook, continued. "See? That is not many. This textbook—hundreds of thousands of students read this every year. After 50 years they still all know Neil Bartlett. When I ask you who the Nobel Prize winner was 50 years ago, no one knows. But everyone knows Neil Bartlett, that's the difference. That's the difference."

In 1966 Bartlett left the Department of Chemistry at UBC and continued on to Princeton and later the University of California, Berkeley, where he remained until retiring in 1993. According to Gary Schrobilgen, acclaimed fluorine chemist from McMaster University: "I've been very privileged to have had Neil as a friend, and I can tell you I still miss him dearly. He was a real scientist and a gentleman."

Information about Bartlett's discovery is available at chem.ubc.ca and on information boards in the hallways of UBC's historic Chemistry Building.

In 2013 UBC Science celebrates its 50th anniversary—a milestone we're celebrating with a series of articles looking back at highlights from a half-century of research advances, stellar graduating classes and dedicated outreach programming.

How Mathematics is Building Bridges Between Africa and UBC



Felix Oghenekohwo. Photo: Martin Dee

A new partnership agreement is providing scholarships for talented African students to study at mathematical sciences centres in Africa, and then encourages them to apply for graduate studies at UBC.

When Felix Oghenekohwo graduated from the University of Ibadan in Nigeria in 2007, he had an undergraduate degree in physics and ambitious plans to continue his academic pursuits at a higher level. Taking his next step in Africa was a challenge, until he learned about a unique program, the African Institute for Mathematical Sciences, or AIMS.

AIMS has an ambitious goal: to develop mathematical and scientific talent across Africa. The institute, founded in 2003, has centres in South Africa and Senegal and plans to open more in other African countries. AIMS offers students across the continent an extraordinary opportunity to study with professors from leading universities and earn credentials that are recognized around the world. By building knowledge, skills and capacity, AIMS develops local talent to solve the continent's problems.

Oghenekohwo began his studies at the AIMS Centre in Cape Town, South Africa, in August 2007. The next 10 months were transformational.

"I built my math skills to the level where I knew I could participate in an international, competitive research group," he says. After receiving his post-graduate diploma from AIMS, Oghenekohwo went on to complete a master's degree in geophysics at the University of Cape Town. By the time he had graduated, he was already back at AIMS, working as a tutor. That's when he met UBC Earth, Ocean and Atmospheric Sciences professor Douw Steyn.

Steyn had gone to AIMS South Africa in October of 2010, with initial plans to stay only a short while and teach a course. He soon decided to extend his stay. Meanwhile, one of his UBC students wanted to follow in his footsteps. James Ferguson arrived in Cape Town in January 2011. Inspired by the goal of AIMS, and driven by his own belief in the value of math, he signed up to be a tutor for a five-month stretch. Ferguson found that his time at AIMS more than repaid his efforts.

"I got more out of it than I gave to it, and I gave it my all," says Ferguson. He notes the remarkable learning process: "As the students go through the program, they take more ownership of their projects, learn to think critically and independently, and learn to solve problems. They gain confidence."

Steyn, Ferguson and Oghenekohwo are part of a global contingent of professors, students and researchers who have embraced the vision of AIMS and have made their own contributions to the program. Their story does not end in Africa.

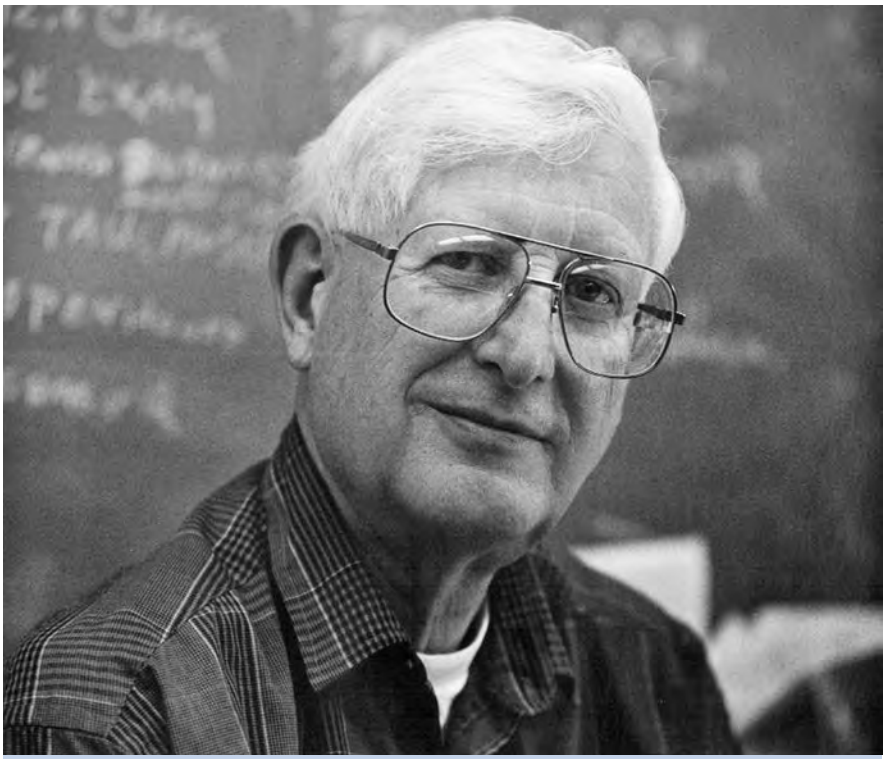
Oghenekohwo is now at UBC doing his PhD in geophysics. Working under the supervision of professor Felix Herrmann, he is a member of a research group investigating dynamic non-linear optimization for imaging in seismic exploration. He is pursuing his goals at a very great distance from his wife Zubeida and their infant son Rukevwe, who remain in Cape Town. It's certainly not easy to be

"As the students go through the program, they take more ownership of their projects, learn to think critically and independently, and learn to solve problems. They gain confidence."

– James Ferguson

apart, but the prospect of a PhD from UBC drives Oghenekohwo forward.

Steyn and Ferguson are back at UBC, but Africa, and AIMS, continue to beckon. Ferguson is considering another trip, possibly to AIMS Senegal, and Steyn has created a new link between UBC and AIMS: a partnership agreement that provides scholarship funding for African students to study at AIMS centres in Africa, and encourages them to apply to UBC for graduate studies.



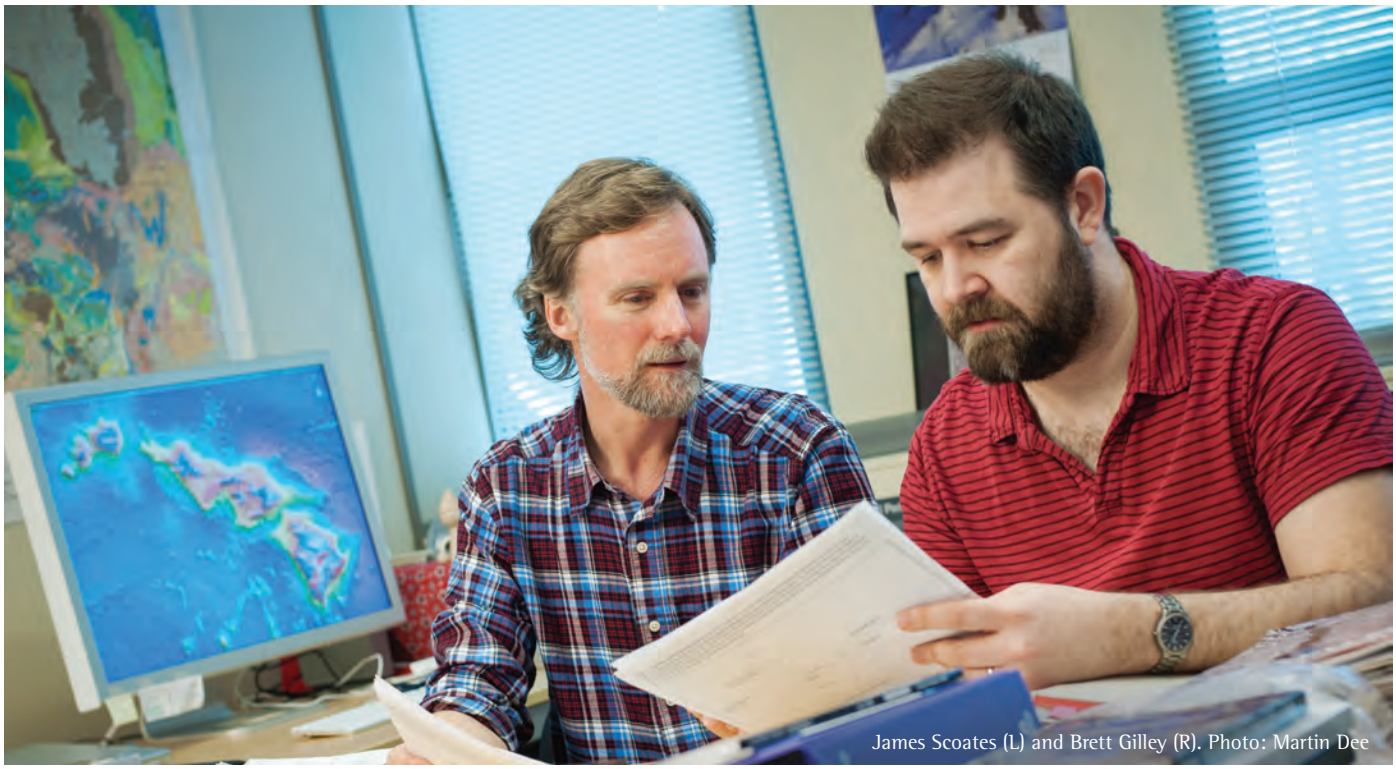
Ted Danner

In Remembrance: Ted Danner, Nancy Martin

The UBC community lost two friends this spring, colleagues who touched the lives of countless science students over their long and dedicated service to the university.

UBC Science's student advising team lost a dear colleague with the passing of long-time staff member Nancy Martin (1956 – 2012). Martin, who held key positions with the Undergraduate Admissions Office for more than 13 years and then led the Science advising team for eight, passed away suddenly of a rare illness. In addition to her UBC work, Martin won acclaim for her volunteer work. In 2010, she was named Coach of the Year by Special Olympics North America. She was the first Canadian to win the award.

Professor Emeritus Ted Danner (1924 – 2012) enjoyed a long career at UBC as a stratigrapher, and was known for his contributions to sedimentary geology, palaeontology and the geology of British Columbia and northern Washington. He taught for many years after retirement and his passion for geology infused several generations of UBC students. Danner's legacy continues to support learning in the earth sciences at UBC through an undergraduate field school bursary.



James Scoates (L) and Brett Gilley (R). Photo: Martin Dee

Teachable Moments: What It Takes to Transform a Science Class

Instructors in Earth, Ocean and Atmospheric Sciences and in Physics and Astronomy on the hard work and constant recalibration required to keep science students on the edge of their seats.

While walking through the halls of UBC's Earth and Ocean Sciences building, Brett Gilley makes an impromptu stop at professor James Scoates' office to scan through a stack of activity sheets. Fourth-year students had drawn, to the best of their recollection, cross-sections of the Earth's crust and typical locations of potential mineral deposits.

"What did students say was the hardest part of the activity?" asked Gilley, a Science Teaching and Learning Fellow (STLF) with UBC's Carl Wieman Science Education Initiative (CWSEI).

"Scale," Scoates answered. It's a small piece of feedback that will not only change how the 16-year veteran teaches future classes, but will also influence the content of several other courses in the department. It pinpoints one of the major challenges earth science students face, which also happens to be one of the key competencies of geological scientists.

This kind of quick meeting has become commonplace since 2007, when 27 courses in EOS were selected to morph from a traditional "stand-and-deliver" model to something much more interactive.

"It was relentless," Scoates recalls. For over two years starting in 2009, Gilley, Scoates and Assistant Professor Ken Hickey dissected their course, identified the most important concepts in the syllabus and articulated clear goals they'd like students to achieve.

Learning activities, such as the deceptively simple drawing exercise, were discussed and tested against a growing literature of cognitive psychology research—a key component of Nobel Laureate Carl Wieman's approach to improving teaching and learning in undergraduate science.

"I can't say I enjoyed all aspects of the process, but I definitely saw the value," says Scoates, who has since partnered with Gilley to revamp two more courses.

Half of the first-, second- and third-year courses in EOS have undergone transformation, and almost three quarters of the department's instructors have participated. As a result, approximately 10,000 students—a majority of them non-science majors—have learned about topics such as natural disasters and climate change in ways vastly different from how their parents learned. Nearly at the end of their five-year course transformation plan, EOS is now in the midst of a complementary curriculum reform.

Halfway across campus, in Wieman's home department of Physics and Astronomy, course transformations are moving ahead

with characteristic meticulousness. There, a partnership between STLF Louis Deslauriers and assistant professor Kirk Madison began.

"I told Kirk about the work I was doing with other courses and I could tell it was outside his comfort zone, but he was also excited by it," recalls Deslauriers, who helped Madison transform a third-year quantum mechanics course.

"The methods Louis described resonated with me, because it's how I mentor my graduate students—less of a step-by-step cookbook instruction and more an open-ended exploration of ideas," says Madison. "The challenge was scaling it up to 90 undergrads."

Deslauriers and Madison focused on creating course activities that required students, in groups of three or four, to articulate, debate and answer a question—what the two playfully call "learning events."

"The process of deliberating, communicating and discovering ideas creates a common bond that connects people," says Madison, who likens it to the spark people experience when falling in love. "Training our students to both think collectively and by themselves is a critical component of a university education, because it forms the basis for the creation and acquisition of meaning and knowledge."

Giving the students time and space to think independently, however, meant relinquishing some control.

"Before I tried these activities for the first time, I worried a lot about crowd control," Madison says. "Do they see I'm doing my job or would they think I'm downloading responsibility onto them? Are they going to respect me?"

What happened next was "unreal," says Madison. "When the discussion time was up and I began to offer my feedback, the room went silent. And for the next 180 seconds the students were on the edge of their seats hanging on my every word.

"In a traditional lecture, you can do jumping jacks, cartwheels and back flips and you'd get some of the students' attention for maybe 10 seconds. But now I had the undivided attention of the entire class for three whole minutes they were primed, it was my window of precious lecture time and I knew I had to make it count."

Madison and Deslauriers recorded such data throughout the term, and their findings have been submitted for publication.

Madison's course now revolves around these learning events—up to a half dozen in a 50-minute class. His "lecture" consists of feedback and question-and-answer sessions. As a result, he has seen improvements in the students' behaviour and their marks, both of which have been carefully documented and analyzed, another key element of the CWSEI approach.

One of Deslauriers's recent studies about two other UBC physics classes made headlines worldwide after it appeared in the prestigious journal Science. Back at Earth and Ocean Sciences, researchers and instructors have produced more than 50 papers, presentations and workshops detailing their experience.

The teams for both departments say that establishing a feedback loop between instructors and students is key to an engaging learning experience.

"The barrier has dropped between me and my students," says Scoates. "They aren't embarrassed about asking questions or saying what they might think is the wrong thing."

"I used to ask myself if I'd covered everything I wanted to in a lecture," says Madison. "Now the question I ask is, 'Did they get it?,' which is a much harder question. But, with constant feedback during class, I'm much more certain of the answer."

"In a traditional lecture, you can do jumping jacks, cartwheels and back flips and you'd get some of the students' attention for maybe 10 seconds. But now I had the undivided attention of the entire class for three whole minutes."

– Kirk Madison

Celebrating a Great Year in Alumni Outreach

Summertime is a good opportunity to welcome our latest crop of spring graduates into the UBC alumni community and to thank those alumni who engaged with UBC Science throughout fiscal 2011-2012. Over that span, more than 4,100 UBC Science alumni took the time to reach out to the Faculty—dropping us a line, attending an event, or offering their stories and experiences as a mentor.

Particularly well attended were Earth, Ocean and Atmospheric Sciences

MENTORING

Chemistry, Biology Added to Mentor-for-a-Day Menu

UBC Science mentorship opportunities for 2013 include new Career Nights in chemistry and biology. A short-term investment of your time can be a huge source of inspiration and guidance for science students exploring their next move.

Plan ahead. The earlier we hear from you, the more time we have to find the right option for you. Consider what type of mentorship role would work best for you:

- Want to learn more about mentorship opportunities that focus on women in science, math and technology? Consider participating in the UBC Women in Science and Engineering (WISE) initiative.
- Want to mentor students in your discipline? Consider taking part in one of UBC's Career Nights in chemistry, biochemistry, biology or physics and astronomy.
- Want to be part of a session that looks at a broad array of careers in science and not just one discipline? Consider mentoring for UBC's Beyond the BSc or the Crash Course in Careers programs.

If you would like to learn more about any of these one-day mentorship opportunities—scheduled for early 2013—email Kim Duffell, Alumni Relations Manager, UBC Science at alumni@science.ubc.ca

alumni-and-friends receptions, mentorship events arranged by UBC's Women in Science and Engineering initiative, and Beyond the BSc. A host of other departmental events, career nights, tri-mentoring programs and alumni panels drew a smaller, but equally passionate, response. The Science Undergraduate Society 51st anniversary reunion in January was notable for offering attendees a touching and humorous walk down memory lane. It has been a great year.

We're reviewing our alumni schedule for 2013 with an eye to celebrating the Faculty's 50th anniversary—an opportunity to look back at the achievements of graduating classes and researchers, and also to look ahead to the future of the Faculty. We're eager to focus and expand our programming, and extend an ongoing invitation to all UBC Science alumni to contact me at any time with ideas and suggestions. We want our alumni offerings to be user friendly, interesting and of value.

Our successes are directly attributable to the enthusiasm and generosity of dedicated alumni and to our campus and community partners. Kudos to everyone who donated their time and talents across the UBC campus, helped put on an event, took time to track down lost alumni, or offered an idea to improve our programming. Thank you! I look forward to 2013 and staying connected with our 32,000 alumni.

– Kim Duffell, Alumni Manager

Mentors and Students Reflect on WISE

I'd like to thank all of the mentors who helped out at the UBC Women in Science and Engineering event at Cecil Green Park House in March. The event was a tremendous success, and we couldn't have done it without the support of our UBC Science alumni. We hope that you all enjoyed the event and were able to share some of your experiences, knowledge and wisdom while engaging with our enthusiastic students.

– Kelly Speck, UBC Science student and member of the UBC WISE 2012 planning committee

I owe much of who I am and where I am today to the exemplary role models and mentors I had during my time at UBC. From offering perspective to providing support and guidance, mentorship has been a huge help in my career. There's no better way to say "thank you" than by paying it forward to up-and-coming women eager to create positive change in the world. It was great to feed off their energy and enthusiasm, and I feel honoured to have spent time with these young women!

– Alia Dharamsi, BSc Integrated Sciences 2010 and WISE mentor

I had a fabulous time as a mentor at WISE 2012. The speakers and mentors were diverse, accomplished, approachable and inspiring. Most importantly, there was very good attendance by mentees, who were enthusiastic, intelligent and inquisitive. It's important to actively encourage the inclusion of women in science, engineering and mathematics, and groups like WISE serve a key role. My sincerest congratulations and thanks to all involved!

– Victoria Stuart, MSc Occupational Hygiene 1995 and WISE mentor

What an exceptionally organized, informative and fun evening! The young women's enthusiasm is contagious, and I applaud them for their inquisitive and motivated approach to career decision-making. I enjoyed the opportunity to reflect on my own career path and to share with young minds what I wish I had known back then. I also appreciated the keynote speaker and her wise words on following your heart. I look forward to WISE 2013 and encourage other mentees to sign up!

– Annie Chou, BSc Physiology 2004 and WISE mentor

If you'd like to learn more about this one-day mentorship opportunity—held every March—email Kim Duffell, Alumni Relations Manager, UBC Science at alumni@science.ubc.ca

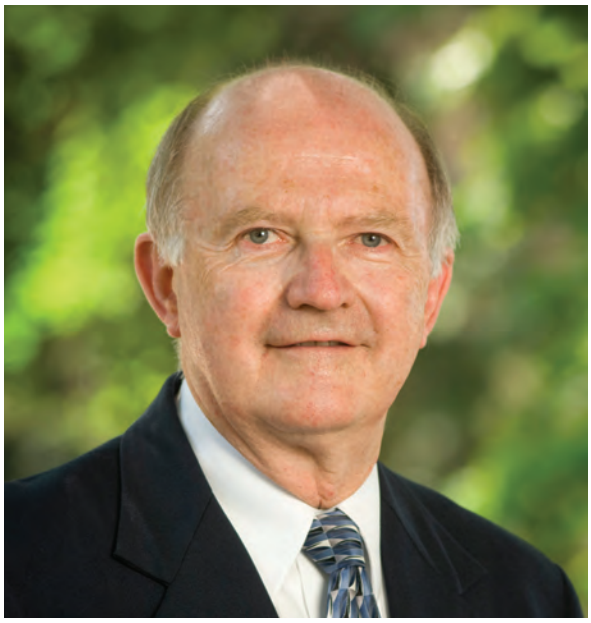


Photo: University of Saskatchewan

Microbiology Alum Wins Gairdner Wightman Award

Lorne Babiuk (PhD Microbiology, 1972), who led the effort to develop a single dose, needle-free vaccine against whooping cough, has been awarded the Canada Gairdner Wightman Award. The honour, which includes a $100,000 prize, recognizes his accomplishments and leadership in vaccine development and research on human and veterinary infectious disease control.

Babiuk—currently vice-president,

CLASS NOTES

What have you been up to since graduation? Submit recent accolades, professional successes, family developments or interesting world travel to alumni@science.ubc.ca or via science.ubc.ca. Include photographic evidence if possible!

1950s

Exploration Geologist Explores Arty Retirement

Retired after 40 years as an exploration geologist with Imperial Oil, Canberra and Husky, Wilfred Gordon Holland (BA Geological Science, 1952) keeps busy with art classes, memberships in three art societies, food bank volunteering, and hiking and walking clubs. Holland continues to travel extensively and takes university courses to stay sharp and connected with the world.

Alum Throws Down Rail Bed Biking Gauntlet

Having biked roughly two-thirds of the 1,400-kilometre Kettle Valley railroad bed, Karl Ricker (BSc General Sciences, 1959 | MSc Geological Sciences, 1968) is a bona fide outdoor enthusiast. He challenges other geology graduates to saddle up and try the Kootenay-region Kaslo and Sandon rail beds from Retallack to Cody, then descend to New Denver and Roseberry on an old Canadian Pacific Railway route. Athleticism obviously runs in the family. Ricker's daughter Maëlle, who won a gold medal in the snowboard cross event at the 2010 Winter Olympics in Vancouver, was inducted into the British Columbia Sports Hall of Fame in 2011.

1960s

Science Alum Named President-Elect of International Council for Science

Gorden McBean (BSc Honours Physics, 1964 | PhD Physics and Oceanography, 1970), currently a professor of geography and political science at the University of Western Ontario, has been appointed president-elect of the International Council for Science. McBean's impressive career has delved deeply into the policy realm, including appointments as an assistant deputy minister with Environment Canada, and membership on UNESCO's High Panel on Science, Technology and Innovation for Development. In 2008, he was made a member of the Order of Canada in recognition of his contributions to the advancement of climate and atmospheric sciences in Canada, and for his leadership in national and international scientific organizations.

Keeping One Step Ahead of the Sheriff

Chris Heath (BSc Geological Sciences, 1960) dedicated the last eight years of his career to

Research, at the University of Alberta—was lead investigator on a $5.6-million Bill and Melinda Gates Grand Challenge in Global Health grant to develop a single dose, needle-free vaccine against whooping cough in infants and young children. Research is now underway to apply the new vaccine-delivery technology to other diseases.

He also led a team that developed six livestock vaccines that were world firsts, including a genetically engineered vaccine. Best known for applying animal research to human diseases, Babiuk created a vaccine against rotavirus-caused diarrhea in calves, which enabled researchers to later develop a vaccine against this viral bowel infection in children. "Sometimes you don't even realize the impact," Babiuk told the Edmonton Journal. "You do it because that's what you think is important—society needs it. Ten years later, you realize the impact."

The Canada Gairdner awards are considered one of the most important international biomedical honours, and are sometimes a stepping stone to Nobel Prizes. Gairdner awardees will travel across Canada this fall giving a series of public lectures. An awards presentation gala event will take place in Toronto in October.

studying a widening skills gap in the geosciences. That process involved interviewing representatives from dozens of oil companies and more than 100 universities in Africa, the Middle East, Asia and Europe. The work so intrigued Heath that he decided to gather data through extensive surveys and publish the results. The research—conducted first at Edinburgh University, then at UBC, and finally out of his Vancouver home—resulted in a series of papers on the labour needs of oil and mining companies and geoscience programs. Heath applied his proficiency for research towards a more personal goal—a comprehensive family tree. He invested considerable time travelling the world exploring his own genealogy—publishing a historical connection to over 420 Heaths and 1,000 relatives dating back to the 1500s. Heath, who moved to Canada in 1955 from the United Kingdom, has also become more involved in civic affairs by sitting on local community centre committees. His personal secret to a good retirement? "Stay involved. It keeps you one step ahead of the sheriff."

Singing the Praises of Chemistry

Bob Perkins (PhD Organic Chemistry, 1976) is enjoying pseudo-retirement in Port Alberni after 32 years teaching chemistry at Memorial University, Kwantlen University College and UBC. Having spent a career presenting university, college and high school workshops and publishing a wide range of papers on chemical education, Perkins continues to share his knowledge and passion with adult learners at ElderCollege in Port Alberni and Quest University Canada in Squamish. When he isn't teaching, Perkins keeps busy by playing guitar, composing songs, writing poetry, gardening, reading, hiking, kayaking, and making and drinking wine. Along with his wife Clarice, Perkins dotes on their three married children, spouses-in-law and six grandchildren.

Surveying the Post-Work Waters

After 20 years as a survey geochemist, Ray Lett (PhD Geological Sciences, 1979) officially retired from the British Columbia Geological Survey this spring. Lett doesn't have firm plans for retirement beyond continuing on with the Survey as an emeritus geoscientist, part-time teaching at the University of Victoria, and a little kayaking in the local Victoria waters.

BC Hydro's Weatherman

Doug McCollor (BSc Physics, 1979 | MSc Geophysics, 1982 | PhD Atmospheric Science, 2008) manages BC Hydro's weather analysis and forecasting programs and finds predicting weather in the province rewarding and challenging. British Columbia's mountains, coastline, proximity to land-falling Pacific storms, and propensity for arctic winter weather keeps McCollor on his toes. His forecasting team not only supports crews and equipment during windstorms, but also power generation and delivery operations across the province. McCollor, an adjunct professor at UBC, works closely with Earth and Ocean Science's Roland Stull on forecasting projects for the energy sector. McCollor and his wife Vivian (also a UBC alum) have a busy and rewarding family life and especially enjoy travelling with their four children.

Science Alum Puts Down Deep Maritime Roots

Gavin Kernaghan (BSc Plant Biology, 1991 | MSc Botany, 1993) is an associate professor of biology at Mount Saint Vincent University, where he directs the Atlantic Root Symbiosis Lab. He is also adjunct professor at Saint Mary's and Dalhousie.

CLASS NOTES

cont.

This Isn't Astrophysics You Know!

The mentors Kristy Roloff (MSc Astronomy, 2001) encountered during her medical residency program were fascinated by her degree in astronomy. She recalls teaching the attending about the lunar orbit and the Big Bang as she worked to master caesarean section procedures. When Roloff struggled with a difficult surgery, her attending physician would tell her, "This isn't astrophysics you know!" One day Roloff answered, "I know. This is harder!" Now an attending physician in obstetrics and gynaecology at Arrowhead Regional Medical Center in southern California, she uses the same phrase to break the tension when teaching her residents. "My unique background prepared me so well. Doing an MSc at UBC taught me time organization and management skills. I learned enough about modern technology to be able to synthesize changing and advancing technologies with the art of the practice of medicine now." Roloff cites her children—Kayden, 6, Leila, 3, and Micah three months—as her most important accomplishments. They, along with her husband Jason and a full-time career, keep her busy and fulfilled.

Kirby Enthusiasm

As a senior lecturer at the Kirby Institute for Infection and Immunity in Society at the University of New South Wales, Jason Grebely (BSc Biology and Chemistry, 2002 | PhD Pharmaceutical Therapeutics, 2007) leads an epidemiology and clinical research program in viral hepatitis. His research focuses on the epidemiology, natural history and treatment of hepatitis C virus infection among people who inject drugs. Grebely collaborates with colleagues around the world, and when he isn't exploring new research partnerships, thoroughly enjoys life in Sydney, Australia.

Science Outreach Imagined

Back in high school, Lindsay Bradshaw (BSc Earth and Ocean Sciences, 2006) would never have imagined pursuing a degree in science. But a few earth and ocean sciences electives later, she was hooked on the versatility a science degree offers. Now with the Birch Aquarium at the Scripps Institution of Oceanography in San Diego, Bradshaw gets paid to work in beautiful locations with exotic animals and educate the public on ocean conservation.

New Arrival

Natasha Freedman (BSc Earth and Ocean Sciences, 2006) is pleased to announce a new addition to the family—her son James. Freedman is taking some well-deserved time off from work as an exploration geologist with Cenovus Energy in Calgary. James is already looking into program options at UBC.

Meeting IBM's Watson at Work

Since 2008, Homa Javahery (Diploma Computer Science, 2001) has been working with a dedicated user interface team at IBM Interactive. Recent work enabled her to interact with the IBM developers of Watson (the computer that defeated two top players on Jeopardy!) and earned her a nomination for an IBM technical award. Javahery also enjoys keeping ties with the academic community. She mentors UBC Computer Science

students, providing industry insight and highlighting the more practical aspects of their education. Through her own research collaborations, she has presented papers in Austria and Berlin on human–computer interaction. In June 2011, Javahery and her husband Behzad celebrated a new addition to the family—their baby boy Daris.

Career Move Down Under

Following studies in structural geology at the University of Toronto, Matthew Williams (BSc Earth and Ocean Sciences, 2006) has relocated to Australia to take up a geologist position with the resource company BHP Billiton.

Patently Obvious Connection

Student Biotechnology Network mentor Vincent Yip (BSc Microbiology and Immunology, 2004 | LLB, 2007) is an intellectual property lawyer at McCarthy Tétrault, a position that allows him to combine science and law. His career goal is to work with life science companies to help them protect and commercialize their technologies. He is an affiliate member of the Intellectual Property Institute of Canada and chairs the Intellectual Property and Technology Law Section of the Canadian Bar Association, BC Branch. Republished courtesy of the Student Biotechnology Network.

2010s

Postcard from Pasteur Foundation Fellow

Since graduation, Ellen Arena (PhD Microbiology and Immunology, 2011) has gone on to hold a distinguished Pasteur Foundation post-doctoral fellow at the Institut Pasteur in Paris, France. "The opportunity to work overseas at such a prestigious research institute wouldn't have been possible without the training I received during my graduate studies. So many doors have been opened as a result." Arena's research focuses on the impact of the bacterial pathogen Shigella flexneri on adaptive immune response.

Industrious Communicator

Kelly Earle (BSc Earth and Ocean Sciences, 2010) applies the technical skills she acquired through geological field work at UBC to corporate communications in a complex industry. Instead of travelling with a map and compass, Earle travels the world as a consultant for two junior exploration companies: Altan Rio and Altan Nevada. Her role allows her to mix strategy, insight and investor relations.

Kirkland Lake Calling

Amanda Ginn (BSc Earth and Ocean Sciences, 2010) has settled in Central Canada—Kirkland Lake, Ontario, specifically—where she's now working at Kirkland Lake Gold as an underground mine geologist.

City Living

While he misses a few of the perks associated with field work, Ryan Turna (BSc Earth and Ocean Sciences, 2010) has gladly traded in hours of high-flying helicopter surveying for a rewarding job as a geological analyst with Infomine. The Vancouver gig is closer to home, family and friends.

EVENTS & REUNIONS

UBC Geology Grads Gather in Toronto, Vancouver

This past winter, professionals from Canada's mineral exploration and mining sectors gathered at conferences in Vancouver and Toronto to toast the new year and connect. UBC Earth, Ocean and Atmospheric Sciences was well represented at both events.

First, in late January, guests celebrated the third annual UBC Science Geological Alumni Reception at Currents restaurant during the 2012 Mineral Exploration Roundup conference in Vancouver. That event attracted more than 200 alumni and friends. In March, we hosted alumni at the Fairmont Royal York Hotel in Toronto during the 2012 Prospectors and Developers Association of Canada conference.

Both events, which take place every year, afforded an opportunity to mingle with fellow graduates, network with industry colleagues, and meet new friends. To ensure that you'll receive advance information about the events for 2013, contact Kim Duffell at alumni@science.ubc.ca or 604-822-1864 to update your email address. These "geo-gatherings" allow us to recognize the contributions our graduates and friends make to industry and the wider community.

In fall 2012, the Department of Earth, Ocean and Atmospheric Sciences will move into its new home in the Earth Sciences Building at UBC. The building will incorporate the latest technologies to create a flexible learning environment, enabling us to continue offering the best education to our students and further our success.

Ethnobotanists, Health Philanthropist Honoured at May Convocation

As the University of British Columbia honoured new graduates during May convocation, UBC Science had the privilege of awarding three honorary degrees as part of the ceremonies. Robert Hung Ngai Ho is a well-known philanthropist who helped establish UBC's Buddhism and Contemporary Society Program in 2005. The program was the first of its kind in North America. Ho has made major contributions to health care in British Columbia, supporting research into prostate and ovarian cancer, as well as supporting services for mental health and addiction.

Honorary degrees also went to Memory Elvin-Lewis and Walter Lewis, who credit their success as

ethnobotanists to their close teamwork and ability to engage the communities they encounter. Travelling the world, the duo have shed light on the medicinal properties of plants, particularly those in the Amazon rainforest.

Help SUS Reclaim Its History

In celebration of the Science Undergraduate Society (SUS) 51st anniversary, alumni and students gathered at UBC's Abdul Ladha Science Student Centre this January to mingle and reminisce.

"Many of the students found that connecting with SUS alumni was incredibly fun and rewarding," says Kiran Mahal, past SUS president and current vice-president, Academic and University Affairs at the Alma Mater Society of UBC Vancouver. "To all who attended, we loved having you and hope that you enjoyed it too. We look forward to seeing you in the future as you remain engaged with the university and the Faculty of Science."

A new initiative is underway to restore the society's records and revitalize its photographic history. Over the last 51 years, SUS has moved offices too many times to count. Consequently, many of the society's historical records and photographs have been misplaced or inadvertently destroyed along the way.

We need your help. If you have any vintage SUS-era photos, documents or items that you would like to contribute, or if you know the names and titles of those who held positions on executive while you were at UBC, please drop us a line. We can scan older photographs or accept donated items. To help SUS reclaim a piece of its history, contact Kim Duffell, Alumni Relations Manager, UBC Science at alumni@science.ubc.ca

Beyond the BSc Goes Above and Beyond

In March more than 300 students and 35 alumni gathered for an evening of discussion and career retrospection at the Life Sciences Centre at UBC. Alumni provided inspirational viewpoints on career highs—and sometimes unexpected lows—to give students authentic insights into job demands, employment trends and career possibilities in science. The largest student–alumni career event held at UBC Science, Beyond the BSc is organized every year by UBC Career Services, the Faculty of Science and a dedicated team of student volunteers. Many thanks to all involved.

Connect With Science, Win Stuff

Congratulations to Doris Fleck (BSc Zoology, 1984) for winning our winter issue challenge for a chance to win an Apple iPod Shuffle. Fleck updated her contact details with UBC Science and was automatically entered to win—couldn't be easier! Stay tuned for more giveaways in the months to come . . .

A Golden Anniversary for UBC Science

In 2013, UBC Science celebrates its 50th anniversary. Watch for special events, lectures and contests—including during UBC Alumni Weekend in May 2013. If you would like to volunteer, get involved, or offer ideas on how to mark this important milestone, drop us a line at alumni@science.ubc.ca

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