



Photo: Bill Crawford, IOOP/TAMU

All hands on deck

Co-chief Scientist and Associate Dean of Science Kathy Gillis (far right) observes the arrival of a core of ocean crust.

Waiting in the equatorial sun, a team of 30 researchers from around the world eagerly anticipates the next core sample of rock to arrive on board the academic drillship JOIDES Resolution. Once the drilling party hauls the core barrel on deck, a flurry of activity begins. But, before the rocks can be measured, photographed and analyzed on board, they must first be excavated from several hundred feet beneath the ocean's crust and ascend through more than 4.5 kilometers of water before reaching the ship's deck.

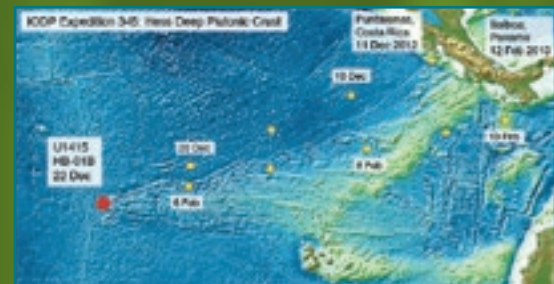
Embarking in Costa Rica, scientists journeyed with the prime objective to sample, for the first time, primitive magmatic rocks known as gabbros from the lower crust in the oceanic Pacific. Gabbros are of particular importance to researchers because their chemistry will allow scientists to test models of how melt is transported from the mantle through the lower crust and ultimately erupts onto the seafloor. The answers to these questions may also reveal what role these processes play in geochemical cycles across the globe. A sophisticated geochemistry laboratory on board allows researchers to examine the composition of different rock types.

Leading the research proposal, Kathy Gillis, UVic's associate dean of science, was selected to act as Chief Co-scientist along with Jonathan Snow from the University of Houston on Expedition 345 from December 2012 to February 2013. "Our role was to keep everyone positive," says Gillis. "The human element

is hugely important. Eight weeks at sea is hard for anybody. We were there to really support our people as cheerleaders." While there was communication equipment aboard the ship, many people experienced highs and lows and missed their families.

Formerly a commercial oil rig, the JOIDES Resolution underwent re-fitting for academic drilling by the Integrated Ocean Drilling Program, an international research organization that explores the history and structure of the earth as recorded in seafloor sediments and rocks. "This expedition was considered a high-risk leg, because it was possible we could have experienced unstable materials or a fault line which could have caused drilling challenges." To avoid poor drilling sites, Gillis explains, "safety was our top concern. Every time a core sample came up, we tested it. We also tested to make sure we were not disturbing any ecologically sensitive areas on the seafloor."

In addition to managing the research party, Gillis and Snow held the responsibility of selecting the specific drill locations. "It was a really big responsibility, picking good drill sites is ultimately the key to success. We would pull up a few rocks and conduct interpretive geology to make sure we'd found a sweet spot before we'd commit to drilling." Since returning from the cruise, researchers including Gillis continue to analyze gabbro samples to catalogue data and form new hypotheses based on the collected data.



Cruise Control:

Positioned approximately a thousand kilometers west of the Galapagos Islands and two degrees north of the equator, the Hess Deep Rift (indicated by a red dot) is one of the few "tectonic windows" in the Pacific. In this area, half-a-million-year-old crust that formed at the East Pacific Rise is slowly being pulled apart, creating an undersea valley the scale of the Grand Canyon. Located at the triple point between the Pacific, Cocos and Nazca tectonic plates, the unique way in which these plates interact gives scientists access to rocks that would normally be located much deeper in the sea floor.

DEAN'S MESSAGE



During the 2012/13 academic year, the University of Victoria celebrates its 50th Anniversary. This milestone provides a perfect opportunity for us to reflect on, not only how far we've come, but also on the exciting places we're going. The City of Victoria is widely recognized as a major tourist destination, the seat of the BC government, the home of

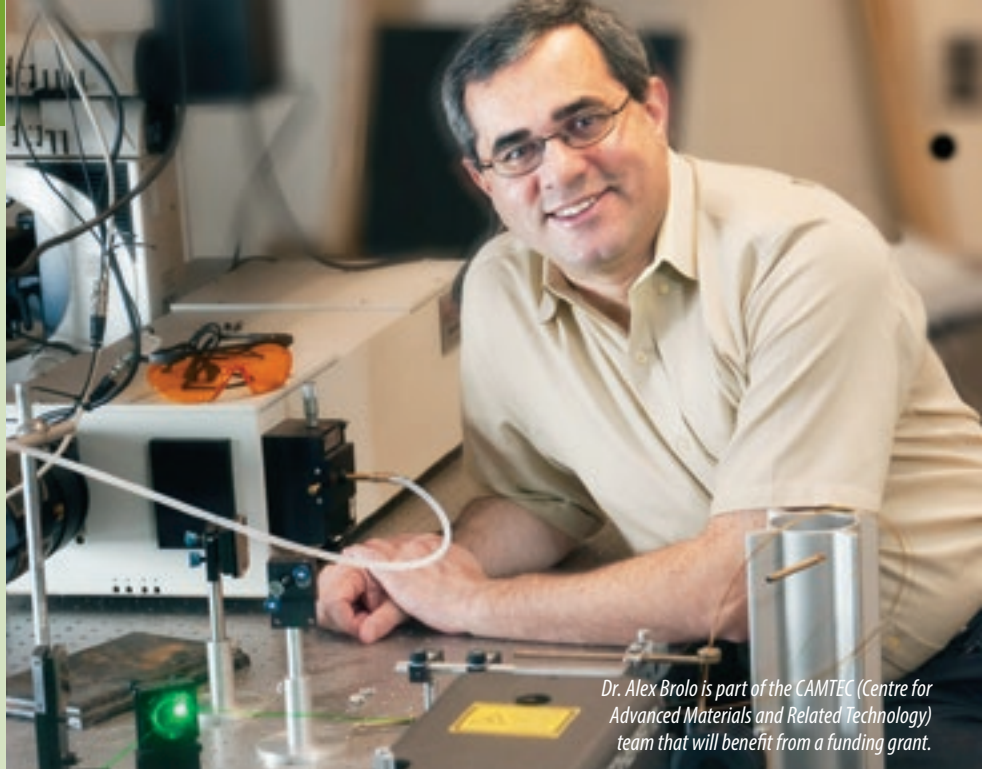
the Pacific naval fleet and more recently the preferred location for many high-tech companies. But throughout this evolution, Victoria has always been the home of UVic. And not surprisingly, UVic, like the city, has grown in size and stature.

UVic has become an intellectual, cultural, social and economic cornerstone of the greater Victoria community, and as a research-intensive institution, UVic's importance amounts to a \$3.2-billion annual economic injection throughout the region—up from \$6.8-million in 1963.

It's also important to reflect on just how far the field of science has come within the last 50 years. We've witnessed the wonder of seeing a man walk on the moon, the explosion of computer hardware, software and the Internet, medical miracles such as magnetic resonance imaging, the sequencing of the human genome and the use of proteomics to understand disease states, the emergences of string theory and the discovery of the Higgs Boson to explain the basic fabric of the universe, nanotechnology, and countless other discoveries that have forever changed our lives.

What does the next 50 years hold for UVic Science? That's a question that only our students and faculty can answer. However, with the recent announcement of significant Canadian Foundation of Innovation (CFI) funding support for projects described in this newsletter, and the delivery of the highest resolution microscope in the world in the world to our campus, I think it's fair to say that we are poised for another great 50 years.

Rob Lipson



Dr. Alex Brolo is part of the CAMTEC (Centre for Advanced Materials and Related Technology) team that will benefit from a funding grant.

Researchers explore new frontiers with boost from \$3.4 million funding grant

Two teams of UVic scientists will get a research boost thanks to \$3.4 million in funding from the Canada Foundation for Innovation (CFI). Part of the funding will be directed towards UVic's involvement in the Prometheus Project—an advanced materials science and technology research program to be conducted by researchers at UVic, SFU, UBC and BCIT to integrate new nanomaterials into useful technological devices.

Chemistry professor Alex Brolo, UVic's team lead for the project, says the money will upgrade lab and fabrication infrastructure so that researchers can translate their designs more effectively into commercially viable products. "This will be a huge step toward taking our ideas to prototypes," says Brolo. "We have a strong core and this investment will help improve the capacity to transform our research into useful applications."

The second research project, lead by Dr. Laurence Coogan, Associate Professor in the School of Earth and Ocean Sciences, is trying to better understand how undersea mid-ocean ridges work. "This is really going to open up new opportunities for our researchers," says Coogan.

"This is one place where we can watch the creation of new ocean crust take place in real time. The process of regeneration of the crust has a broad impact on the ocean and is one of the fundamental aspects of how our whole planet works." Their portion of the CFI grant will fund new scientific instruments for the underwater cable operated by the Ocean Networks Canada NEPTUNE observatory to enable real-time data observations and sampling at the hydrothermal vents from subsea volcanoes.

Putting the fun back in physics

Inspiring students about physics in an introductory non-physics-major course (PHYS 102) is a challenge that Dr. van Netten welcomes. Whether it's starting a fire with nothing but a few primitive tools, bringing in his collection of finely crafted homemade bows, or running simulations of many of the shock-wave experiments he has been part of in his career, this enthusiastic instructor makes physics real for his students.

In his role as his department's Experience UVic outreach coordinator, he created a whirlwind presentation on The First Million Years of Physics. The talk takes the audience from the origins of fire making to the theory of

quantum physics. Last summer, the International Space University invited van Netten to give a presentation, via videoconference, on his model for a supersonic wind tunnel.

By spending many years as a UVic physics student himself, (BSc '85, MSc '88, PhD '95) van Netten knows first-hand what it takes to keep his classes engaged. For his ability to excite and challenge students, van Netten received an Alumni Award for Excellence in Teaching at an awards celebration during Alumni Week in February from the UVic Alumni Association.

Alex van Netten displays his Alumni Award for Excellence in Teaching for his inspired teaching.



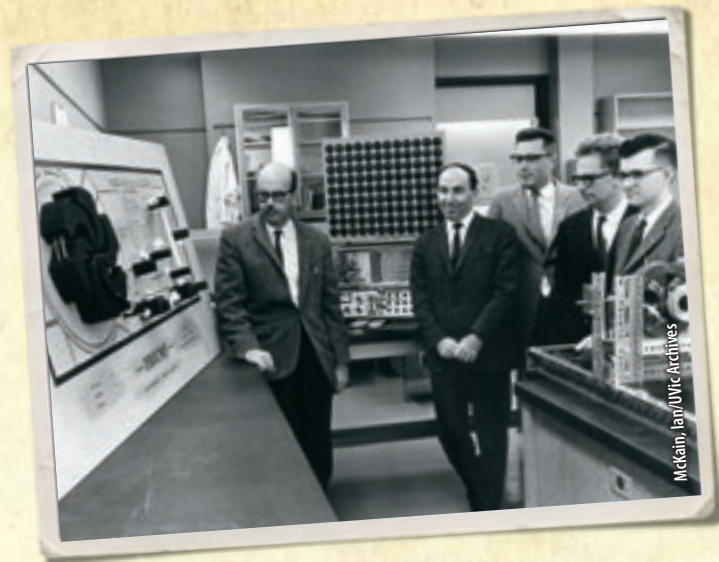
50 years of great memories



While UVic has become a world-class center for innovation through research and discovery, at the core of our achievements is a group of enthusiastic students, faculty and staff. Several members of UVic's scientific community have come forward to confess their successful (or sinful) moments on campus since its founding in 1963.

Gerry Poulton says one of his best moments is when he, as a young member of the Department of Chemistry, volunteered with the Vancouver Island Regional Science Fair as a judge in the early 1970's. In the 35 years it has been on campus, he says "this has been, and continues to be, a fabulous opportunity for local students and their families to visit UVic."

Former Victoria College student David Leeming recalls: "There were a number of people who encouraged me as a student and early in my career." Now retired, Leeming participates in the "Mathmania" outreach program at elementary schools. "I am now trying to provide the same encouragement to a new generation of mathematically talented students."



Five of the eight UVic physicists who worked at TRIUMF in 1968: Michael Pearce, Nadhim Al-Qazzaz, Lyle Robertson, Donald Lobb and Roland Cobb. TRIUMF is Canada's national laboratory for nuclear and particle physics, which UVic co-founded in the 1960s.

Still Smiling!

With its whimsical happy-face dome, the Climenhaga Observatory remains one of the most iconic sights on campus. Alumni Dr. Richard Dewey (BSc '83 Physics) and Dr. John van Heteren (BSc '83 Physics) confess that the night before their graduation the class "celebrated our degrees by gaining access to the roof (not too difficult when at least three of our fathers—Weaver, Dosso, and Dewey—were faculty) and secured a mortar board on the telescope's dome."



Red Hot!

A group of physics students pose in matching red coversalls during the early 1980s. Originating as a symbol of the group's unity during a co-op term, the coversalls quickly became an inside joke. They eventually inspired the name of the "Physics Red" scholarship that was later endowed by class alumni Kevin Collings (BSc '85) and Tina Chow (BSc '85).



Student's success supported by alumnus' generosity

As Roberta (Ellie) Parton nears the completion of her biochemistry degree, she reflects on the people who helped her on her journey to UVic.

"I did not believe I would graduate from high school, so attending university seemed like an unreachable goal." Originally from the Wei WaiKum band of the KwaKwaKa'wakw First Nation in Campbell River, Parton says, "My school attendance and grades growing up were abysmal." Parton lacked self-esteem and motivation in the classroom, but when faced with an unexpected teenage pregnancy, "I was forced to grow up suddenly."

Striving to be a role model for both her five-year-old daughter and her community, Parton volunteered on the Tsawout reserve, a part of the Coast Salish territories, as a young mother mentor. "I am passionate about increasing the representation of Aboriginal people in post-secondary education." Her hard work and dedication earned her the Norah and Calvin Banks Aboriginal Leadership Award in the Sciences in 2012.

"Financially, the calculated costs of my education outweigh my available resources." With a busy academic and volunteering schedule, Parton says, "This award allows me to learn everything I can about my field of study while providing for my family so that I can still see my daughter grow up. For this support I am extremely grateful to Mitch Banks." Alumnus Dr. Calvin Mitchell (Mitch) Banks (BSc '67, PhD '71 Chemistry) strongly believes in the empowerment that an education provides. After a successful career, Mitch and his wife Linda decided to endow a number of scholarships in appreciation of several UVic professors that had a major impact on Mitch's life.

Parton's dream is to become a family doctor serving Aboriginal communities. "Culture is the core of my existence and this awareness will help me better serve my people." She believes that with everything she's already been through, there is nothing to stop her from achieving her goals. "My experiences give me the strength, my culture gives me the wisdom and my daughter gives me the motivation."

To support student scholarships, please visit extrweb.uvic.ca/donatenow



Honours students parade their research

Amid a sea of poster boards, students proudly discuss their research to a caravan of professors who evaluate them on their research and presentation skills. Welcome to HonoursFest 2013, the second annual celebration of undergraduate science research at UVic. Competitors explained their research posters to judges, fellow students and community members alike. The aim was to create a setting much like ones students will find themselves in when pitching their ideas to employers, funding agencies and the public after graduation.

"This is what students will be doing when they go into the real world. They'll be in a conference-style setting, presenting their work in a positive way. This is a great venue in which to gain experience, and to have on a CV," says Associate Dean of Science Kathy Gillis. "Effective communication skills are key to any profession and are increasingly important for scientists."

Jennifer Evancio (Department of Biochemistry and Microbiology) won the \$2,000 first prize for her efforts to crystallize a surface protein from a parasite that causes African sleeping sickness.

Honorable mentions earned a free membership to a professional association in their discipline: while second- and third-place winners Connor Bottrell (Department of Physics and Astronomy) and Johanna Berry (School of Earth and Ocean Science) respectively; each earned \$1,000 in cash.



Valentina Lawrence

Co-op student explores research outside of the classroom



Currently pursuing a degree in Biochemistry, Jenna Ries is already a published researcher. As a co-op student, she completed work terms with both the National Research Council of Canada and the BC Cancer Agency Deeley Research Centre. At the Deeley Centre she worked on a project investigating novel drug combinations for targeted therapy of ovarian cancer and co-authored two papers in the peer-reviewed scientific journals.

"Jenna's work made it possible for us to publish our findings in a short period of time, which undoubtedly helped to raise the profile of our research both regionally and internationally," says her supervisor Dr. Julian J. Lum, BC Cancer Agency.

"It's great to be able to work alongside experts in leading edge cancer research," says Ries of her co-op work term. "I've earned a lot of valuable laboratory experience—like trouble-shooting and critical thinking, how to approach the problem and how to ask the right questions—but I've also learned a set of soft skills like professionalism, teamwork and co-operation." Her hard work hasn't gone unnoticed: Ries was named Co-op Student of the Year for Optional and Professional Programs in November 2012.

To learn more about hiring a co-op student visit www.uvic.ca/coopandcareer



Alumni Making a Difference

To commemorate the University of Victoria's 50th anniversary, the UVic Alumni Association selected 50 alumni as representatives of a diverse group that demonstrates leadership on behalf of the university through their volunteer efforts and engaged support. These outstanding individuals were recognized on February 7 at the Alumni Who Made a Difference celebration during Alumni Week.

Recipients from the Faculty of Science included Mitch Banks (BSc '67, PhD '71 Chemistry); Brenda Beckwith (PhD '05 Biology); Kara Flanagan (BSc '02 Math, MA '04 Economics); Richard Flury (BSc '70 Physics); Nancy Turner (BSc '69 Biology); and Glenda Wyatt (BSc '98 Earth and Ocean Sciences).

In the last 50 years, UVic has awarded over 106,000 degrees, diplomas or certificates. Incorporated in 1965, the UVic Alumni Association's mission is to lead the worldwide involvement of alumni in UVic life through a variety of programs, services, and events offered in partnership with the university. The complete list of the 50 recipients can be found at: <http://alumni.uvic.ca/docs/AlumniWhoMadeADifference.pdf>

Honoris Causa

Dr. Naomi Halas, scientific pioneer in the interaction between light and structures at the nanoparticle scale, received an honorary degree in Science during the fall 2012 convocation. Based at Rice University in Houston, Dr. Halas pioneered the emerging field of nanophotonics—the interaction between light and structures at a scale 100,000 times smaller than the width of a human hair.

Halas is the inventor of nanoshells—tiny particles that have a potential application in cancer therapy by harnessing their ability to convert light into heat to thermally destroy a solid tumor while minimizing damage to healthy cells. She hopes that the technology will dramatically improve the prospects of cancer patients as a general approach for removing lumps in a variety of soft tissue types.

Giving Back

Our alumni make a difference by volunteering at events, speaking to classes, hiring co-op students, or supporting scholarships. To explore how you can help change the lives of current and future students, contact Ms. Jody Kitts, Development Manager at 250-853-3245 or kittsj@uvic.ca

Planning a reunion?

The UVic Alumni Association can help by promoting your event to classmates, arranging speakers, or providing door prizes. Network and keep involved by exploring the list of groups and upcoming events to find something that's right for you. <http://alumni.uvic.ca/events/reunions.php>

Faculty News

ScienceMatters is published twice yearly by the Faculty of Science to communicate the faculty's goals, strategic direction and activities in order to connect alumni with each other and the university.



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