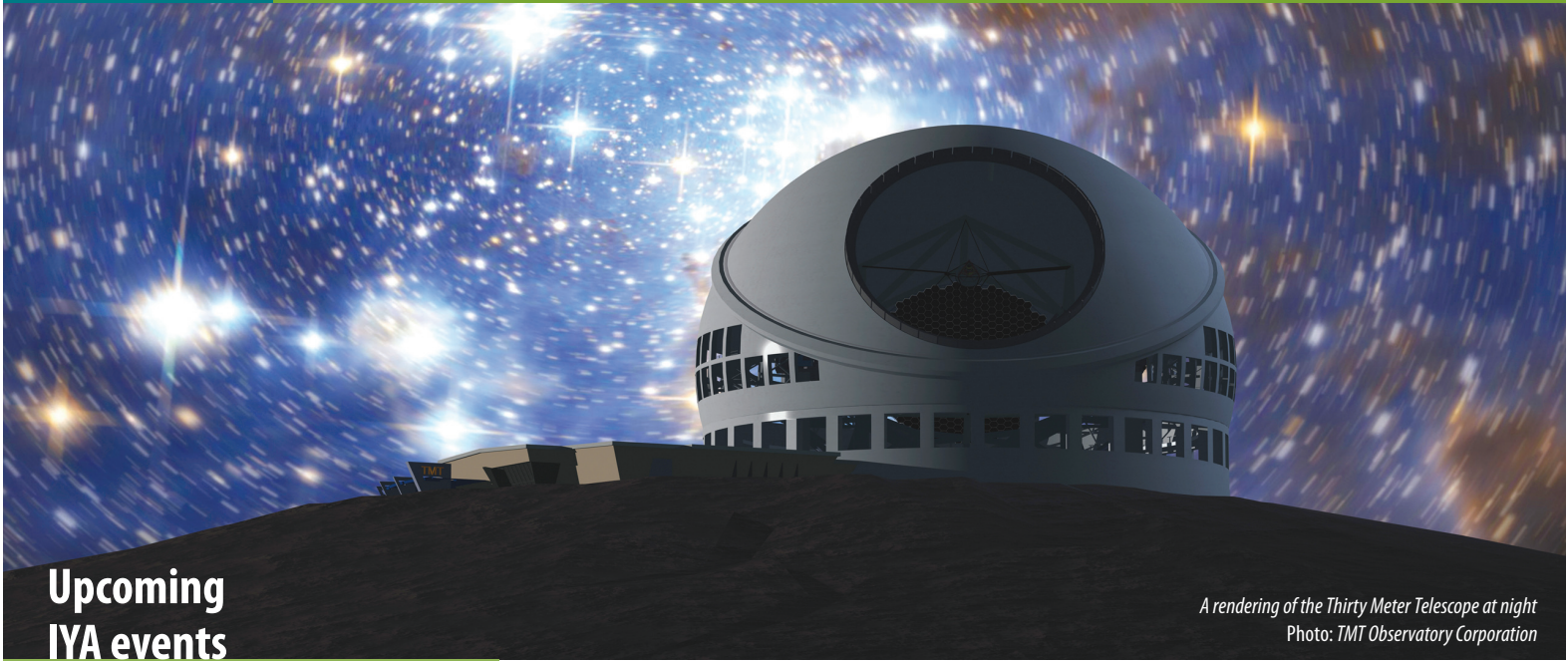




University
of Victoria
Science

Science Matters

University of Victoria, Canada
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*A rendering of the Thirty Meter Telescope at night
Photo: TMT Observatory Corporation*

Upcoming IYA events

Astronomy Café

Get together with local astronomers over coffee to discuss the night sky. On clear nights, there is kid-friendly observing. Free, every Monday evening from 7:30 to 9:00 p.m., until Dec. 31, at the Fairfield Community Centre.

A Short History of Night

This performance by Theatre Inconnu runs from June 2 to June 20. It charts the beginnings of modern science through the dramatization of two of the Renaissance's most colourful figures: Danish astronomer Tycho Brahe and geometrician/mystic Johannes Kepler. Cost is \$12 per adult, \$10 for seniors and students. See www.theatreinconnu.com for more details or call 250-360-0234.

For more events see Canada's IYA website:
<http://www.astronomie2009.ca>

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International Year of Astronomy: Join the yearlong astronomy party

To mark the 400th anniversary of Galileo Galilei's first astronomical observation through a telescope, astronomers from 140 countries are having a yearlong party. The International Year of Astronomy is organized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Astronomical Union. Canada's celebrations feature local and regional events such as public telescope viewings and public lectures, astronomy-themed plays, musical performances and art exhibits aimed at introducing the cosmos to Canadians.

UVic alumnus Dr. Luc Simard, who works at NRC's Herzberg Institute of Astrophysics, next door to the Dominion Astrophysical Observatory on Little Saanich Mountain says,

"I am thrilled to be involved. We get to celebrate 400 years of astronomical research, and recent advances in understanding the origin of galaxies, stars and planets have been breathtaking."

Dr. Simard and UVic faculty Dr. Chris Pritchett are two of the high-profile Canadian astronomers picked to deliver public lectures across Canada through the Galileo Lectures Program. Dr. Simard spoke in Nanaimo on April 15. His lecture covered the latest theories on how galaxies form and evolve.

Dr. Simard, who completed his PhD at UVic in the early-nineties, is currently working with UVic faculty Drs. Kim Venn and Colin Bradley in the US-Canada collaboration to build the next generation of earth-based telescopes, the Thirty Meter Telescope.

"I bought my first telescope (15 cm diameter) at age seven, and now working on a thirty-meter giant goes far beyond the wildest dreams of that little boy observing from his backyard," he says.

Victoria's other Galileo lecturer, Dr. Pritchett, is a Professor in Physics and Astronomy who specializes in supernovae, stars that have exploded. He is part of the Canada-France-Hawaii team that runs a powerful telescope atop the Mauna Kea volcano in Hawaii. "The remarkable thing about being able to see the supernovae is that they are so incredibly luminous," he describes.

In the 1990s it was discovered that one could plot how fast the universe is expanding by measuring the brightness of supernovae. Contrary to expectations, it was found that the expansion of the universe is not slowing down, but accelerating – something that is currently not understood.



Claire Cupples, PhD
Photo: UVic Photo Services

Head in the stars, feet on the ground. Message from the Acting Dean...

Whatever their field of teaching, research or administration, faculty and staff in Science have their feet firmly planted on the ground. They have to in this busy season. As students prepare for summer studies or co-op work terms, head off to the Bamfield Marine Sciences Centre or work on-campus as Science Venture counselors, faculty and staff are busy preparing new curricula, updating existing curriculum, and preparing for the onslaught of new students in September. Our researchers continue to reach for the stars – some more explicitly than others.

It's been a good year so far for the Department of Physics and Astronomy, what with public celebrations for the International Year of Astronomy, and the mounting anticipation of the first experiments at the Large Hadron Collider at CERN, where UVic struts its stuff with the ATLAS particle detector. There is a new telescope for the new science building in the works, too.

Amid all this high-energy and star-gazing is another, quieter development that is equally exciting: the ongoing development

of the Medical Physics program, a joint venture between UVic's Department of Physics and Astronomy, the British Columbia Cancer Agency and the Life Sciences program of TRIUMF.

The program focuses on improving cancer radiation therapy. At its core are seven faculty members who, with six graduate students and several co-op students, have access to three dedicated research labs at UVic, as well as radiotherapy equipment at the BC Cancer Agency - Vancouver Island Centre. Dr. Andrew Jirasek is the only fulltime UVic faculty member in Medical Physics. Among his projects, he is studying how biological material responds to ionization radiation at the molecular level. He is also developing new 3D polymer gel dosimeters to improve the measurement of radiation dose.

Whether focused on a single cell in the human body, a single particle in the atom, or a single star in the universe, our physicists and astronomers are doing exciting, world class science.

Alumni profiles: A couple of Cupples return to UVic

In 1974, Claire Wilson and Will Cupples were working on 4th year undergraduate research projects in the Biology Department at the University of Victoria. Claire was in the basement of the Cunningham Building, trying to grow blood cells in a Petri dish – she doesn't remember why. Will was on the first floor, dunking his fellow students and his supervisor in a 100 cubic foot tank of cold water to see how fast their bodies cooled – all in the interests of improving survival in B.C.'s coastal waters. Twenty-nine years, four cities, four more degrees (two each) and seven (!) universities later, the Cupples returned to UVic, Claire to the Department of Biochemistry and Microbiology and Will to the Biology Department and the Centre for Biomedical Research.

The first stop was the University of Calgary Medical School, where both did MSc degrees. After an interlude back in Victoria to consider the future, and replenish their bank account, the next stop was Toronto where Will did a PhD at the University of Toronto, and Claire did one at York University. They spent their post-doctoral years in Los Angeles, she at UCLA and he at the

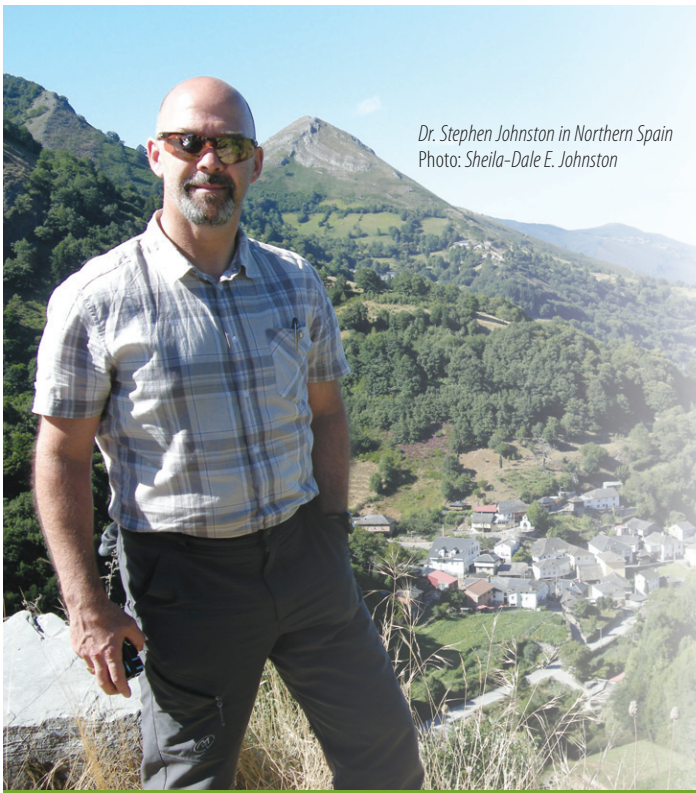
University of Southern California. Keen to return to Canada, they spent the next 14 years in Montreal, now at last as fully fledged scientists.

However, Concordia University (Claire) and the Lady Davis Institute/McGill University (Will) eventually proved no match for the pull of the West Coast, and it was back to Victoria and UVic at last in 2003.



Claire and Will Cupples in New Zealand

Will remains a physiologist, a self-identified "nut who studies kidneys". Students in the Island Medical Program benefit from his obsession. Claire has continued to study life at the cellular and molecular level, specializing in DNA repair and mutagenesis. In recent years, she has also taken on the study of human behaviour as a departmental Chair, Associate Dean and, currently, Acting Dean of the Faculty of Science. Life is never dull for this couple of UVic alumni.



Dr. Stephen Johnston in Northern Spain
Photo: Sheila-Dale E. Johnston

Research Profile: A Geologic Journey

Dr. Stephen Johnston, Associate Professor, the School of Earth and Ocean Science

Mountains are not just part of the BC scenery. Mountain belts are the factories in which stable continental crust is manufactured. They exert a first order control on local and global climate; and they are host to the bulk of Earth's economic mineral deposits. Much of human history, including the development of distinct populations and political boundaries, revolves around the natural boundaries formed by mountain belts.

Understanding the origin and evolution of mountain systems is, therefore, of great geological, economic and social significance. Dr. Johnston's research focuses on one of Earth's most important mountain belts – the Variscan Mountains of northern Spain. Between 300 and 250 million years ago, a series of massive continental collisions gave rise to the Variscan mountain system, rivaling the Himalayas in scale. It was these collisions that forged the Earth's last great supercontinent, Pangea, and which presaged one of the greatest biological catastrophes of Earth history – the Permian-Triassic extinction event, during which more than 95 per cent of all species vanished. By better understanding the origins of the Variscan Mountains, he hopes to determine what forces led to the formation of Pangea, and to resolve the role of Earth's changing paleogeography in climate change and in the biological evolution of life on Earth.

Biochemistry and Microbiology Expand Experiential Training

I hear, I know. I see, I remember. I do, I understand.
Confucius

Melissa Doyle, Laboratory Instructor, Department of Biochemistry and Microbiology



Stephanie Puckett and Erin Cooke with personalized lab coats in the 406B Lab
Photo: M. Doyle

The Department of Biochemistry and Microbiology has always emphasized the importance of experiential learning in its undergraduate programs. Students gain valuable skills and expertise in molecular methods through a combination of practical laboratory exercises, co-op work placements, directed studies courses and honours projects.

Laboratory instructors and assistants, technical support and central services personnel are key to offering lab programs in the face of increasing enrollment and limited space. To assist with this increase, we've welcomed Allison Maffey on board as our third intermediate-level laboratory instructor.

Highlights of the last year include renovations of our undergraduate teaching spaces, and improvements to our Central Services Facility, which handles the bulk of the media, glassware and other

preparations required to accommodate the 300-400 students enrolled in our laboratory courses. We've also added a state-of-the-art tissue culture room where intermediate and senior-level students are introduced to working with biological safety cabinets, antibody-secreting cell lines and tumour cell lines.

The incredible dedication and commitment of our staff has not gone unnoticed. In 2008, Dr. Rozanne Poulson received a President's Distinguished Service Award. Barb Currie, our Senior Microbiology Laboratory Instructor received the prestigious Gilian Sherwood Excellence in Teaching Award, as well as the Faculty of Science Teaching Award in 2007.

It's important, however, not to overlook the contributions of our graduate students teaching assistants. Alicia Lammerts van Bueren (PhD, UVic) received the Andy Farquharson Graduate Student Teaching Award in 2007, and Stacey Maher received the 2008 Department of Biochemistry and Microbiology Graduate Student Teaching Award.

To find out more, please visit: <http://web.uvic.ca/biochem>.

Bamfield Marine Sciences Centre Grows – and Still Enthralls



For over 35 years, the Bamfield Marine Sciences Centre (BMSC) has provided students from five western Canadian universities with valuable on-site learning in marine biology. The coastal environment and the Centre's research resources make Bamfield a popular destination for third and fourth year undergraduate students each summer. They spend three to six weeks at Bamfield, conducting independent research on the ocean.

BMSC also attracts some of the world's top researchers in biology, ecology and oceanography. The largest employer in Bamfield, BMSC has hosted over 1,000 UVic students since 1972. Originally the Trans-Pacific Communications cable station, the centre has seen some upgrades over the past few years. New buildings in the last five years include the Rix Centre for Ocean Discovery (lecture, lab and research space), the Buchanan Lodge (new dorms), a new flume for investigating hydrodynamics and a new dive vessel, the Barclay Star. There are plans to improve wastewater management, generators, docks and other aspects of the physical infrastructure.

In September of 2008, BMSC welcomed its new Director, Dr. Brad Anholt, a biology professor at UVic and the Canada Research Chair in Experimental and Applied Community Ecology. "The Centre changes people's lives," he says, noting how people who think they are only coming for a brief visit, end up working there. With plans for a quarterly e-newsletter, a reunion weekend and an archive of class photos, there will be plenty of opportunities for BMSC Alumni to reconnect with each other and the Centre.

Alumni from the Centre have a new home on the BMSC website at <http://www.bms.bc.ca/alumni/>.

STEM Aboriginal Youth Campus Tours 2009

The Aboriginal STEM Project is a pilot outreach project aimed at engaging Indigenous youth in Science, Technology, Engineering and Math, through hands-on learning. It is run by the Faculties of Science and Engineering, the Office of Indigenous Affairs at UVic and seven local Aboriginal communities.

So far in 2008–09, UVic has worked with youth in their communities. On February 19, it was UVic's turn to host the youth on campus. It was a pleasure to have 116 Indigenous youth from middle and high schools from South Vancouver Island. More than half of them had never been to UVic before. Eight fantastic workshops developed by faculty, staff and students from the Faculties of Science and Engineering covered everything from math, chemistry, biology and ocean sciences to computer science.

Exposure to science and engineering may help open up new ideas about the many opportunities at UVic for our visitors. Given this success, there are plans for an even bigger event next year.

A solar collector lights up a student of the STEM tour



Faculty News

Dr. Thomas Fyles has completed his term as the Department Chair of Chemistry; Dr. David Harrington is Interim Chair while the search for a new Chair goes forward.

Dr. Gary MacGillivray has finished as Chair of Mathematics and Statistics; Dr. Ian Putnam is Acting Chair.

Dr. Chris Nelson joins the Department of Biochemistry and Microbiology as an Assistant Professor. Dr. Nelson's lab uses budding yeast and cultured human cells to study how evolutionarily conserved 'epigenetic' features of genes are maintained in health and mis-regulated in diseases such as cancer.

Everything old is new again... in Chemistry

Rosemary Pulez, Administrative Officer, Department of Chemistry

What's new in Chemistry? Almost everything these days. In terms of personnel: 11 of our 19 faculty started within the past eight years; five of our continuing staff have been here less than two years; and of course there are our remarkable graduate students, 60 in all, who as a group are in a constant state of flux as degrees are completed and new students sign-up.

With the opening of the Bob Wright Centre (the new Science Building), most of our synthetic chemistry researchers have moved into new space. The state-of-the-art facilities in this building allow our chemists to study compounds exhibiting multifunctional magnetic properties; new stable radicals and new magnetic materials; the structure, function and mimicking of natural membranes; lanthanide chemistry; organometallic chemistry and catalysis; interactions between medically important proteins; and supramolecular medicinal chemistry – to name just a few.

Physical chemistry researchers are on the move into new space in the Petch building where they can set up sensitive laser systems and instrumentation for surface electrochemistry, including applied projects on fuel cells; supramolecular dynamics; solving structural problems in biophysical chemistry; structure of membranes and surfaces; molecular electronics and spin electronics; the development of surface sensitive spectroscopic methods, and so on.

Overall, it's an exciting time in Department of Chemistry. For more news, visit our website at <http://www.chemistry.uvic.ca>

Mathematicians Win Grant to Promote Operator Algebras

Dr. Marcelo Laca, Professor, Department of Mathematics and Statistics

The Pacific Institute for the Mathematical Sciences (PIMS) has awarded a \$240,000 grant to establish a Concentrated Research Group (CRG) in Operator Algebras and Non-commutative Geometry. The grant goes to UVic mathematicians Dr. Ian Putnam and Dr. Marcelo Laca, together with Dr. Douglas Farenick from the University of Regina and Dr. Tony Lau from the University of Alberta.

PIMS CRG's are designed to promote research and training in mathematics in the Pacific Rim region through lecture series, summer schools, international conferences and postdoctoral fellowships.

Although operator algebras were originally developed as the mathematical model for quantum mechanical systems, the subject has recently broadened its scope in a spectacular way and now has serious and deep interactions with many other branches of mathematics. The Canadian operator algebras community is internationally recognized for its strength, and a long-term goal of the CRG is to develop leadership in this area in Western Canada.



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