

INGENUITY

FACULTY OF APPLIED SCIENCE
ENGINEERING NEWS
FALL 2012 / WINTER 2013

THE NEXT BIG THINGS IN:

MINING GLOBAL
CITIZENSHIP

SUSTAINABLE TRANSIT

ROBOT ETHICS

SOLAR POWER



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA



PHOTO CREDIT: DON ENHARDT

Dean's Message

Dear UBC Engineering alumni and friends,

With the end of the fall term at UBC comes the Engineering Undergraduate Society's annual holiday caroling, bringing cheer and their Red spirit to all. Whether or not you took part in these festivities as a student, they remind us to take time to celebrate our successes. Even as the students celebrate the holidays with their revelry, they are preparing for careers in important fields where they can truly help people and make a difference.

Speaking of our students, they have voted to increase their fees in order to replace the dilapidated Cheeze clubhouse with the planned Engineering Student Centre. But their fees alone will not cover the entire cost. We continue to need your support — the support of our alumni and friends — to develop this new space for our students (see p. 14). On the topic of celebrating successes, I'm delighted to recognize two major partnerships that will be hosted by UBC. The first, the India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability (IC-IMPACTS), is a \$30 million project supported by the Canadian government and state and industry partners in India (see p. 13).

The second major government-funded partnership announced is a \$25 million grant from the Canadian International Development Agency to establish the Canadian International Institute for Extractive Industries and Development (CIIEID). The successful proposal — led by our Norman B. Keevil Institute of Mining Engineering in partnership with Simon Fraser University and École Polytechnique de Montréal — establishes a coalition to deliver knowledge and technical assistance aimed at helping resource-rich developing countries manage their natural resources responsibly and transparently (see p. 7).

These projects showcase how UBC Applied Science people work together with other academic, nonprofit and industry partners to lead in global citizenship — making an impact and helping people worldwide.

In closing, thank you for the tremendous support you've given me over the past year; it has been a pleasure to meet so many of you. I'm delighted to inform you that the next Dean of Applied Science was recently approved by the UBC Board of Governors. Please join me in welcoming Dr. Marc Parlange as our next dean. An expert in water resources engineering, he is currently professor and dean of the School of Architecture, Civil and Environmental Engineering at École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. As dean there he led the development and expansion of the school by recruiting outstanding faculty, establishing interdisciplinary academic programs, successful fundraising and building institutional connections throughout Europe. His appointment will begin July 1, 2013 (see p. 14).

Thank you for your continued support of the UBC Faculty of Applied Science.

Best regards,

Eric Hall
Dean Pro Tem

"...thank you for the tremendous support you've given me over the past year; it has been a pleasure to meet so many of you."

Eric Hall, Dean Pro Tem

ON THE COVER

Raw copper ore. UBC's Norman B. Keevil Institute of Mining Engineering is poised to advance best practices in Mongolia and around the world.



Photo by: Martin Dee

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ENGINEERING EDUCATION

THE NEXT BIG THING IN GLOBAL CITIZENSHIP

UBC's Norman B. Keevil Institute is poised to advance best practices in mining in Mongolia and around the world.

PHOTO: JUAN DIERKES

Mongolia, a country of roughly three million people, stands on the precipice of economic escalation. A landlocked country between China and Russia, its traditional agriculture-based, nomadic economy has been infused with capital from the development of the Oyu Tolgoi mine in the south Gobi Desert.

Slated to commence commercial production in January 2013, Oyu Tolgoi, a joint venture between Turquoise Hill Resources and the Government of Mongolia, is the largest financial undertaking in Mongolia's history and is expected to account for approximately one-third of the country's gross domestic product. Copper production from the mine is expected to reach 450,000 tonnes annually.

Mongolia has been making headlines as one of the fastest-growing economies in the world.

"The feeling of optimism in the capital is palpable," says UBC Professor Julian Dierkes of the Institute of Asian Research and an expert in mining regulation in Mongolia. "The well-dressed young people of Ulaanbaatar are filled with energy and charm and are poised to leap ahead in economic terms."

No wonder these young people are excited about their future. The government agreement with Oyu Tolgoi stipulates the mine will employ 90 per cent Mongolian nationals during operations and provide educational scholarships for local students.

In March 2012, to help ensure the success of the operating agreement, UBC's Norman B. Keevil Institute of Mining Engineering and the Institute of Asian Research signed a Memorandum of



UBC Professor Bern Klein (left) and Baasanjav Mijid, Director of Higher and Vocational Education for the Ministry of Education, Culture and Science of Mongolia, sign the memorandum of understanding to partner in the education of Mongolian mining engineers.

Mongolian mining graduates enrolled in UBC short courses in Mongolia summer 2012 with Professor Malcolm Scoble (back row, centre).

Understanding (MOU) with Mongolia's Ministry of Education, Culture and Science aimed at advancing cooperation between UBC and Mongolian universities to promote best practices in mining.

One of the goals of the MOU is to implement a 2+2 exchange program with the Mongolian University of Science and Technology (MUST). The program involves two years of university study in Mongolia and two years at UBC, resulting in a Bachelor of Applied Science degree.

As part of the agreement, partners will seek industry support to assist Mongolian nationals in obtaining Master of Engineering degrees at UBC. And the agreement also facilitates collaboration of Mongolian university faculty with those at UBC for joint seminars and meetings.

Finally, the MOU articulates International Partial Tuition Scholarships that will enable Mongolian graduate students to pursue research-based masters and doctoral degrees at UBC at a cost similar to that of domestic students.

Through an earlier agreement between UBC and MUST, the Keevil Institute has been training engineers for the Oyu Tolgoi Mine as well as for the Mongolian Mining Corporation — one of the

largest coal companies in the nation — through the UBC Certificate in Mining Studies program. Currently, 47 Mongolian nationals are enrolled in the program and plan to graduate in 2013.

During the summer of 2012, UBC Professors Scott Dunbar, Davide Elmo, Robert Hall, Michael Hitch and Malcolm Scoble travelled to the Oyu Tolgoi mine site and delivered brief courses on mine design and planning, rock mechanics and asset management.

"This is UBC's opportunity to make an indelible impact — not by mimicking what others are doing but by building on our expertise and experience and sharing those strengths globally," says UBC Professor Bern Klein, Head of the Keevil Institute. "Our faculty has tremendous strength not only in the technical aspects of mining but also in sustainability as it relates to governance, communities and health, corporate social responsibility and environmental-impact mitigation. Sharing best practices for sustainable growth behooves us as global citizens operating in a global context."

The MOU will also benefit UBC mining engineering students.

Mongolian countryside image by UBC Professor Julian Dierkes, a sociologist who studies mining regulation.



PHOTO BY MARTIN DEE

UBC Professor Bern Klein with PhD candidate and Mongolian national Zorig Davaanyam. Using high pressure grinding rolls, they study energy-efficient mineral processing technology.

“The collaboration with Mongolia enables us to show mining as a global industry embedded in a community context,” says Klein.

UBC students will gain a better understanding of how to work with local communities, develop best practices in new mines and work in developing countries — all within a social, cultural, political and environmental framework.

“The same challenges faced when developing mining projects in Canada are faced in other parts of the world. There are expectations of high environmental standards, healthy and safe mining practices, and benefits to communities,” says Klein.

With 1,200 of the world’s mining exploration companies located in British Columbia, and most headquartered in Vancouver, it is highly appropriate for UBC to be engaged in this area of education and global citizenship.

“We have an extremely strong link with the Canadian mining industry and we are poised to benefit industry as well as the development of Mongolia with best practices,” says Klein.

According to Zorig Davaanyam, a Mongolian national and PhD student investigating energy-efficient mineral processing technology at UBC, “Mongolia needs people trained in Western standards and technology to run the mines.”

He notes that mining baccalaureate degree programs available in Mongolia focus more on academics and less on practical applications than Western programs, and many courses don’t have affiliated laboratories. Also, collaboration between academia and industry is less developed.

“Without industry connections, Mongolian students miss out on the invaluable applied learning that programs like Engineering Co-op and Engineers-in-Training provide,” says Davaanyam. “Hands-on learning and industry experience are essential for developing the necessary skills for Mongolians to be employed at top levels.”

As far as the overall UBC partnership is concerned, Dierkes says, “We are extremely fortunate that our colleagues in mining are concerned with the social and political impact of mining while also deploying their technical expertise. This concern is at the roots of a very productive interdisciplinary collaboration on questions of governance.”

“Engineers have the opportunity to make the world a better place — not just through technical training, but with regard to social license,” says Dierkes — social license meaning a project’s ability to earn and maintain the approval of the people who live and work in communities associated with mines. ■



UBC, SFU to further global sustainable mining practices through \$25M Institute

The University of British Columbia and Simon Fraser University will lead an international coalition to help developing countries benefit from their natural resources in environmentally and socially responsible ways.

The establishment of the Canadian International Institute for Extractive Industries and Development (CIIEID), funded by a \$25 million grant from the Canadian International Development Agency (CIDA), was announced last October, with the goal of sharing Canadian expertise in extractive industries. The selection of UBC and SFU to operate the Institute was announced November 23, 2012, by the Honourable Julian Fantino, Minister of International Cooperation.

In 2008 alone, exports of oil and minerals from Africa, Asia and Central America were valued at \$1 trillion. Canadian companies, many headquartered in Vancouver, B.C., dominate the world's mineral exploration, and Canada relies heavily on its own resource industries.

UBC's research and education in the extractive sector spans nearly a century, with a strong emphasis over the past decade placed on sustainable develop-

ment and corporate social responsibility through its Norman B. Keevil Institute of Mining Engineering. SFU's Beedie School of Business offers Canada's longest-standing Executive MBA program for sustainable mining and houses the Responsible Minerals Sector Initiative, fostering global dialogue for the extractive sector.

Building on the respective strengths at UBC and SFU and in partnership with École Polytechnique de Montréal, the CIIEID will offer developing countries best-practices knowledge in extractive technology, public policy and regulations, and health and education outreach in order to empower industry, governments and nongovernmental organizations to reduce poverty while protecting the environment.

"Through CIIEID, we will be able to share UBC's extensive experience in outreach efforts in developing countries, such as the Global Mercury Project, which has already helped improve the health of artisanal miners in Latin America," says Professor Bern Klein, Head of UBC's Norman B. Keevil Institute of Mining Engineering.

One of the first tasks of the CIIEID is a strategic analysis of the sector, delivery of educational courses in Canada and overseas, and two conferences. Initial activities will focus on countries in Latin America, Sub-Saharan Africa and Asia.

Global Mercury Project

In small mining towns in Colombia, artisanal gold miners are using mercury and cyanide to extract minute quantities of gold. In the process, toxic chemicals are released into the environment and contaminate local food sources, as well as foods such as bananas and shrimp, which are exported globally. The Global Mercury Project (GMP), partially funded by the United Nations and led by UBC Mining Engineering Professor Marcello Veiga, is working with mining communities around the world to address technical issues that will increase production while improving the health and working conditions of miners.

For additional information, visit www.globalmercuryproject.org. For a video of artisanal-mining research in Ugandan salt mines, visit youtu.be/7c088qqasB0.

RESEARCH

SUSTAINABLE TRANSIT— AROUND THE WORLD AND ACROSS B.C.

Lessons from the great cities of the world

PHOTO BY MARTIN DEE

Jinhua Zhao has worked with New York, Hong Kong, Chicago, London and Boston to improve their transit systems.

The world's largest cities are resorting to tough love to reduce traffic congestion and pollution, according to UBC urban planning and transportation expert Jinhua Zhao.

Zhao points to Shanghai, which auctions off only about 10,000 car registrations each month. To get on the road, residents in China's largest city of 23 million people must bid on vehicle license plates. Depending on the number of bidders, each license can cost as much as 60,000 yuan (approximately \$10,000 Cdn).

And while residents complain about the cost, they have accepted the policy and are more concerned about the fairness and transparency of revenue use, says Zhao.

"Not only do these auctions help to reduce congestion, they provide a financing tool. Shanghai generates up to 5 billion yuan (approximately \$0.8 billion Cdn) annually in revenue," says Zhao, who serves as a commissioner for the China Planning Network, a think tank focused on China's urbanization. He will discuss these and other strategies at next month's annual conference for the Association of Collegiate Schools of Planning in Cincinnati, Ohio.

"If you look at any of the great cities in the world, people have asked themselves 'where do we want to be in 20 years,' and then found a way forward," says Zhao, an assistant professor jointly appointed in Civil Engineering

and at the School of Community and Regional Planning.

In Beijing, for example, residents must enter a lottery to obtain a license plate. And in the U.K., drivers have to pay the equivalent of \$13 Cdn during weekday work hours to enter central London—the world's largest congestion zone.

"Although these approaches may not offer direct solutions for Vancouver, they help bring transportation and urban-development options to the table that otherwise would not even be discussed," says Zhao, whose research areas include public transportation, transportation economics and policy and information technology.

After all, hot-button issues of public-transit funding, congestion and neighbourhood density are only going to intensify, he says.

"Vancouver wants to grow by one million people, so how does the city want to distribute that population? Is it possible for Translink to achieve their goal of having most trips by transit, walking and cycling by 2040?"

Since joining UBC in 2010, Zhao has been helping Translink explore the use of an automated data collection (ADC) system to improve public transit. ADC refers to sophisticated systems that gather, merge and analyze data from passenger-use patterns and GPS-equipped buses and trains.



“ADC provides a spatial and temporal picture of how people are using transit and where it needs to improve,” says Zhao, who over the past decade has worked with New York, Hong Kong, Chicago, London and Boston to hone their ADC systems. For example, in the City of London, he says, “My team and I developed methods that have been used to refine public transit’s scheduling process and service quality measures. London was able to improve forecasts for customer demand and the provision of customer information.”

At Translink, Zhao is focusing on ADC data that will give users and planners a sharper picture of bus-service reliability. “For example, customer information will report more than just the average travel time. It will also inform users the variation of the travel time and the probability of bus arriving and getting to the destination on time.” ■

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Students help a B.C. community ditch the car

How to coax residents from a Vernon, B.C., neighbourhood to park their cars and get active? Four students in the School of Engineering at UBC’s Okanagan campus are working on it.

In a new initiative—supported by UBC’s Okanagan campus, B.C. Interior Health and the City of Vernon—students will develop a Vernon Neighbourhood Active Travel Plan for residents of the East Hill community. Active travel focuses on walking, cycling and transit as a primary means of transportation.

“Vernon is a highly automobile-dependent community, with most trips taken via single-occupant vehicles,” explains Gordon Lovegrove, project supervisor and associate professor. “If this trend continues as Vernon grows, residents will experience increased traffic congestion, vulnerability to an increase in chronic diseases and obesity, decreased air quality and increased greenhouse-gas emissions.”

The City of Vernon is keen to tackle these issues head-on, and its Transportation Plan 2008-2031 focuses on transit, cycling and walking initiatives, setting the target for 2031 to 20 per cent of trips by foot or bicycle.

Fourth-year engineering students Luke Friesen, Sandra Iroegbu, Cody Marwood and Alex Schuirmann will begin their work by surveying East Hill residents to develop a benchmark database of current travel modes, as well as identifying barriers to active transportation, and will then create a series of recommendations to encourage active modes of travel.

Source: UBC Okanagan News

From left: Alex Schuirmann, Luke Friesen, Sandra Iroegbu, and Cody Marwood.



THE NEXT BIG THINGS: THE ETHICAL ROBOT

By AJung Moon, PhD candidate, UBC Collaborative
Advanced Robotics and Intelligent Systems Laboratory (CARIS)

Robotics technologies are showing up all around us. Vacuum cleaners drive themselves in your home, toys move, talk and learn. Robots are being used in battlefields, as cuddly alternatives to pet therapy in care centres and as programmable and customizable aids in bedrooms.

So should we be worried about a robot uprising? Perhaps not yet. But there are many reasons why we should be more cautious about the technology. Not only are these technologies increasingly prevalent, they are about to generate novel dilemmas for us humans.

We are now asking deeper questions about our creations: What kind of relationship should we have with robots? How should a robot behave? What kind of decisions should robots be allowed to make? And what should a robot do? Existing engineering standards do not govern ethical use, deployment or behaviour of robots.

For example, if you were to see a child banging a squirming and screaming toy dinosaur robot against a table, would you take the robot away, or discipline the child so she learns it is bad to hurt the robot? The robot is just a toy and doesn't actually get hurt in the same sense animals do, so what is the difference between this robot and a ball that gets kicked around?

These kinds of conundrums are driving researchers to consider the next big thing in robotics: the ethics of robots and robotics.

About 10 years ago, a field of study called Roboethics was established to explore these social, legal and ethical questions pertaining to robotics. Roboethics is becoming more important to roboticists who strive to make robots more human-friendly.

This is not a trivial field of inquiry. Although people seem to know what is socially, legally and ethically

appropriate in daily life, what someone should do tends to change quite a lot depending on the context, the situation and from person to person. If robots don't know what is appropriate and what is not, then we would not want them roaming around our homes, interacting with our elder parents or children.

At the UBC CARIS (Collaborative Advanced Robotics and Intelligent Systems) lab, we are trying several ideas. One approach is to make robots communicate better. This way, what a robot is doing or is about to do is easily understood by people interacting with it. When conflicts occur, robots could communicate with people to figure out what it should do next.

Another idea is to seek help from lots of people. We think that listening to the feedback from all stakeholders of the technology can help us better understand how to implement human ethics into design. My colleagues and I at the CARIS lab, CNR-IEIT (Italy) and School of Robotics (Italy) will launch an initiative we call the Open Roboethics initiative. In the near future, we will have an online space for you to share your opinions about what you think is acceptable robot use and robot behaviour. All of your feedback will be heard by designers and can also inform policy makers. We also hope to share some geeky contents, such as benchmarking and simulation platforms where designers all around the world can test their robot behaviours against what people have said is acceptable.

Maybe this way, everyone will get to have a say in what a robot should do, and define what "ethical" and "friendly" really means in a robot universe. ■

For more info on CARIS: <http://caris.mech.ubc.ca>.

To read AJung Moon's blog: www.robethicsdb.com.

Reprinted with permission from UBC Reports, January 2013.

A NEW GENERATION OF SOLAR POWER: NANOTECHNOLOGY AND MORE EFFICIENT ENERGY

By Alireza Nojeh, Associate Professor, Electrical and Computer Engineering, and research team members Parham Yaghoobi (PhD'12, ECE), Mehran Vahdani Moghaddam (Research Associate)

Our UBC research team has discovered a new method of trapping heat, called the “heat trap” effect, and used nanotechnology to create a novel device for converting sunlight to electricity.

Solar cells are now found all around us, from rooftops to portable electronic devices to experimental solar-powered vehicles. These cells typically operate based on what is called the photovoltaic effect, where the absorption of light leads to the creation of mobile electrons in a semiconductor, which generates electric power. However, among other factors, costly materials and complex manufacturing processes have limited the commercial success of many of these devices.

An alternative approach consists of using focused sunlight to heat a metal to thousands of degrees. At such elevated temperatures, electrons literally boil out of the material. If another piece of metal is placed nearby, it can collect these electrons and create electric current, thus delivering electric power. This method, called thermionic conversion, is, in principle, simple and inexpensive. Theoretical studies show that thermionic devices can be quite efficient and generate very high electric power relative to their size and weight. These devices have been of interest for decades for organizations like NASA.

Still, progress has been limited. The few existing prototypes use elaborate heating systems involving large, complex, light-focusing and heat-reception mechanisms only available in specialized test facilities. The reason is the fundamental challenge of heating a conductor to the high temperatures needed for boiling off electrons. Although one can easily heat an insulator using sunlight and a simple lens (remember the favourite childhood trick of burning paper using a magnifying glass), this does not work for conductors,

where the generated heat dissipates to a wide area. The result is that impractically large amounts of light are needed to reach the required temperatures.

But this was before our UBC team observed the ‘heat trap’ phenomenon. Through this effect, the heat generated in a carbon nanotube array illuminated with light can become trapped, easily increasing the surface temperature to thousands of degrees. Our team has been able to build a small, compact thermionic solar cell prototype and successfully demonstrate its operation.

Carbon nanotubes, tubular carbon structures with tiny nanoscale diameters, are materials with rich and promising electrical, optical, thermal and mechanical properties. A carbon nanotube array is made of millions of individual nanotubes and looks like an unremarkable, regular black material to the naked eye. Yet, this discovery shows how the novel properties of nanostructured materials may provide solutions to decades-old energy problems.

Though still a long way from commercial application, the UBC device is a breakthrough toward a new, potentially inexpensive way of creating clean electricity. The invention was recently reported in the journal *AIP Advances* and, together with the University Industry Liaison Office, we are exploring its commercialization potential. ■

Link to AIP Advances publication: http://aipadvances.aip.org/resource/1/aaidbi/v2/i4/p042139_s1

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Newsworthy

Hallisey Atrium dedicated to engineer, business leader.

An expansive, light-filled atrium in the University of British Columbia's new Engineering, Management and Education building in Kelowna has been dedicated to the memory of the late Richard S. Hallisey (BAsc '63, CIVL, GEOE).

Hallisey, who passed away in 2011, was a UBC-educated professional engineer who enjoyed a successful career and life as a business leader. Born in Lytton, B.C., he moved to Kelowna at the age of 15 and graduated from UBC in 1963 with a degree in civil and geological engineering.

After graduating from UBC and working in the oil fields of Alberta, Hallisey was awarded a Master of Business Administration degree from the University of Western Ontario in 1968. He then launched his career on Bay Street in Toronto, Canada's financial capital, starting with Pitfield, Mackay, Ross as an oil and gas analyst. In 1978, he co-founded First Marathon Securities Limited, where his passion for mining and the impact it had on communities around the world allowed him to develop global mining projects and financing structures that touched the lives of thousands in Canada and abroad.

"Richard was extremely dedicated to engineering at UBC and wore his UBC ring with great pride," said Pamela Hallisey, who unveiled the plaque formally dedicating the atrium in her late husband's name during a ceremony on October 12, 2012. The Richard S. Hallisey Atrium is a mezzanine-level space connecting the new building's north and south towers.

The Hallisey family made a private donation to UBC Okanagan as part of UBC's start an evolution campaign. The campaign goal for the Okanagan campus is to raise \$100 million for student scholarships and bursaries, new facilities and research programs and to double the number of alumni involved annually in the life of the university by 2015.

"It is particularly fitting that Richard's academic preparation for success in life blended engineering and business education," said Spiro Yannacopoulos, Director of the School of Engineering and Acting Dean

of the Faculty of Management at UBC's Okanagan campus. "This building is home to Engineering in the south tower and Management in the north tower — as well as the Faculty of Education and College of Graduate Studies — and we are very grateful to the family for their support."

The Richard S. Hallisey Atrium is a focal point of the new building and an important social space for students, said Deborah Buszard, Deputy Vice-Chancellor and Principal of UBC's Okanagan campus.

"Future generations of students — tomorrow's engineers, business leaders, educators and so many others — will benefit from the generosity of the Hallisey family," said Buszard. "They will take their UBC experiences out into the world to accomplish great things and contribute to their communities in so many ways.

"We are honoured that the Hallisey family has chosen our campus, and in particular such an important space on our campus, to serve as a permanent commemoration of a man who gave so much to his family, his profession and his community." ■



A plaque dedicating the Richard S. Hallisey Atrium was unveiled October 12, 2012. From left, Spiro Yannacopoulos, Director of the School of Engineering and Acting Dean of the Faculty of Management at UBC's Okanagan campus; Pamela Hallisey, wife of the late Richard Hallisey; their children, Lisa Orr and Andrew Hallisey; Deborah Buszard, Deputy Vice-Chancellor and Principal at UBC's Okanagan campus; and UBC student Suraj Raveendran.

RESEARCH

Top Canadian, Indian institutions form \$30M partnership to improve water and infrastructure safety, eradicate diseases.

Scientists from the University of British Columbia, University of Alberta, University of Toronto and 11 leading institutions in India are joining forces in a \$30 million partnership to tackle urgent issues in both countries.

Supported by the Canadian government and state and industry partners in India, the India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability (IC-IMPACTS) will focus on three key areas: safe drinking water, reliable infrastructure and effective prevention and treatment of water-borne and infectious diseases. The partnership will support new technology spinoffs and the training of more than 700 students and researchers.

Through the development, deployment and commercialization of new technologies, and the training and exchange of students and researchers, IC-IMPACTS is expected to generate economic benefits for both nations while building research capacity and solving issues of importance to both countries.

Prime Minister Stephen Harper announced the partnership in November while in New Delhi.

"Collectively, UBC, U of A and U of T have an impressive track record of international research collaboration in India that brings about tangible changes to communities. This partnership, unprecedented in scale, will allow us to find — and apply — solutions to some of the most pressing issues in both Canadian and Indian communities," says Professor Stephen Toope, UBC President.

Hosted at UBC, the partnership was spearheaded by IC-IMPACTS' Scientific Director and Civil Engineering Professor Nemkumar Banthia (PhD '87 CIVL). Banthia will oversee the Sustainable and Safe Infrastructure research program, which will develop new tools to assess the condition of aging concrete structures; develop low-cost, concrete-based building materials reinforced with fibre from agricultural waste; and devise low-cost strategies for strengthening structures against earthquakes. From UBC, Civil Engineering Professors Carlos Ventura and Dharma Wijewickreme



(PhD '90 CIVL) will join forces with the teams.

A signature strategy of IC-IMPACTS is to demonstrate technologies in selected partner communities in Canada and India. In India, Banga (in Punjab), Nagpur (in Maharashtra) and the Roorkee (in Uttarakhand) were selected to participate. These cities range in population from 20,000 to 5 million and face challenges that collectively represent broader societal challenges in India.

For example, Banga and Nagpur rely strongly on thermal power plants, producing large quantities of fly-ash waste. IC-IMPACTS researchers will investigate the feasibility of using fly-ash as a cement replacement for new constructions. Agricultural waste and natural fibres such as cotton are also plentiful in these communities, allowing researchers to explore using natural fibres to reinforce nonstructural building materials such as roofing, siding and flooring. Nagpur and Roorkee are both situated in seismically active zones, and their civil infrastructure has badly deteriorated. IC-IMPACTS researchers will assess, monitor and devise a strategy for strengthening buildings, bridges, dams and power plants.

Similar challenges exist in these communities in the areas of water management and health and disease prevention.

In Canada, IC-IMPACTS will work with Pangnirtung, Nunavut; Lytton Creek First Nations, British Columbia; Thorsby, Alberta; and the Munsee-Delaware Community, Ontario.

The Integrated Water Management research program, led by U of A Mechanical Engineering Professor Sushanta Mitra, will develop, test and implement new technologies to monitor water quality and treat potable and waste water. UBC collaborators include Chemical and Biological Engineering Professor Madjid Mohseni and Civil Engineering Professor Pierre Bérubé (PhD '00 CIVL). ■

Full story at: www.engineering.ubc.ca/canadian-indian-partnership.

Global citizen appointed dean of Applied Science



Dr. Marc Parlange appointed dean of UBC Applied Science.

The University of British Columbia has announced that Prof. Marc Parlange has been named the next Dean of the Faculty of Applied Science; his five-year appointment commences July 1, 2013.

An expert in water-resources engineering, Parlange is currently dean of the School of Architecture, Civil and Environmental Engineering at École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, where he helped lead the development and expansion of the school by recruiting outstanding faculty, establishing interdisciplinary academic programs, leading successful fundraising and building institutional connections throughout Europe.

The appointment of Parlange as the 12th Dean of Applied Science follows an extensive international search led by UBC Provost and Vice President Academic Prof. David Farrar, of UBC's Vancouver campus, and Prof. Wes Pue, Provost and Vice Principal of UBC's Okanagan campus. The search included consultations with faculty, staff and students.

"Prof. Parlange brings a strong commitment to excellence in research, teaching, academic leadership and service to the community," says Farrar. "His research — focusing on water-resources engineering in the Alps and projects in Burkina Faso addressing challenges of hydrology, climate change, and health in remote communities — demonstrates his ability to act as a global citizen, bringing people together and addressing critical challenges facing society."

Before joining EPFL in 2004, Parlange was a professor at Johns Hopkins University, with joint appointments in Mechanical Engineering and Earth

and Planetary Sciences. There he served as chair of the Department of Geography and Environmental Engineering in the Whiting School of Engineering and helped establish a new undergraduate major in Environmental Engineering and a successful Center for Environmental and Applied Fluid Mechanics. From 1990 to 1996, Parlange served as a professor in the Colleges of Engineering and Agriculture at the University of California, Davis.

"We look forward to working with Prof. Parlange as he brings his strong commitment to student learning, research excellence and academic leadership to this role," says Pue. "A global engineer is essential to furthering UBC's ability to connect across our campuses, throughout North America and worldwide."

Born in Rhode Island, Parlange earned a Bachelor of Science degree in Applied Mathematics from Griffith University, Australia, in 1984, and a Master of Science degree in Agricultural Engineering in 1987 and a PhD in Civil and Environmental Engineering in 1990, both from Cornell University.

"UBC, with its tier-one reputation and host of offerings, including medicine, business and law, is uniquely poised to enable collaborations across disciplines and provide solutions to society's most pressing issues, including clean energy and accessible health care," says Parlange. "I look forward with enthusiasm to the opportunity to build connections and further UBC's ability to provide solutions and truly make a difference."

Prof. Parlange participates in various professional societies, including the Swiss National Science Foundation research commission for engineering, and has served as editor-in-chief of the American Geophysical Union (AGU) journal *Water Resources Research*. ■

STUDENTS

Engineering Student Centre update



Artist rendering of planned UBC Engineering Student Centre.

Plans for the Engineering Student Centre continue to move forward. As follow-up to our last update in *Ingenuity*, we were unable to obtain UBC Board 2 and 3 approvals as planned but are still on track for those necessary approvals in February and September. Ground breaking is anticipated for October 2013, with a completion date of fall 2014.

Thank you to all who've donated to this much-needed new building. Applied Science and our students are very excited about the possibilities this new space will enable. We look forward to welcoming all of our alumni back to campus to see the facility in summer 2014. ■

If you'd like to learn more about the building or make a donation, please contact Debbie Woo at 604-822-6856 at debbie.woo@ubc.ca.

RESEARCH

UBC, Fraunhofer formalize partnership aligning world's top clean-energy researchers

UBC forged a formal partnership in spring 2012 with Germany's Fraunhofer Society, Europe's largest research institution for applied research, to focus on renewable-energy technologies.

UBC President Stephen Toope and Fraunhofer Senior Vice President Research Planning Ulrich Buller signed a memorandum of understanding (MOU) that establishes a framework for joint projects in areas that include biomass-to-energy conversion, fuel-cell and hydrogen technologies, electrolysis, and industrial aspects of solar-cell and wind-turbine manufacturing. The MOU seeks to foster scholarly and student exchanges while increasing links with industry and commercialization opportunities.

Fraunhofer selected UBC as the first Canadian partner in a strategic program called ICON, which supports the cooperation of its institutes with premium international research partners.

As a globally recognized leader in sustainability, UBC has committed to aggressive targets to reach

zero greenhouse-gas emissions by 2050 and will soon launch a pilot project to harness biomass for heat and electrical-energy generation.

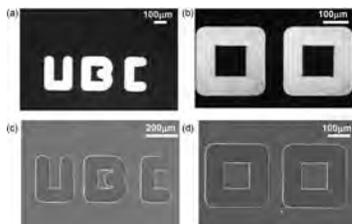
UBC's interdisciplinary Clean Energy Research Centre (CERC) aims to improve existing energy technologies such as fuel cell and clean-energy combustion systems and develop new sustainable sources of energy, including hydrogen and biofuels.

UBC's principal investigator in developing the Fraunhofer partnership is Professor Walter Mérida, CERC associate director. Research leaders also include Professors John Grace, David Wilkinson (BASc '78 CHEM) and Tony Bi of Chemical and Biological Engineering, and Yusuf Altintas of Mechanical Engineering.

Fraunhofer has developed world-class expertise in renewable-energy technologies. With more than 60 institutes, Fraunhofer employs more than 20,000 people and has an annual budget that exceeds \$1.8 billion euros — two-thirds earned through industrial and publicly funded projects. As a link between academic research and business practice, Fraunhofer contributes considerably to technology transfer between universities and industry. ■

RESEARCH

Micromirrors reflect light in darkest material



Patterning micromirrors in the carbon nanotube (CNT) forest. (a) Optical image of reflective channels with letter patterns (UBC) created on a bare CNT forest. (b) Optical image of an alternating array of optical super absorber and reflector. (c) and (d) SEM images of the structures in (a) and (b), respectively, showing the structural integrity and smoothness of the surface texture for the resultant patterns.

A team of UBC Electrical and Computer engineers led by Professors Kenichi Takahata and Alireza Nojeh made a shiny new discovery that may lead to advances in optical sensors and “bendy” electronics.

Carbon nanotubes — a key material for future electronics, optics and other fields of materials science — are known to be among the darkest matter on earth, absorbing more than 99 per cent of incoming light. They can absorb the entire visible range of electromagnetic waves more efficiently than any other man-made material.

While studying and manipulating microscale patterns of vertically aligned carbon nanotubes at the structural level, the research team found that by gently bending carbon nanotubes with a tungsten rod, they could create a laterally oriented polished finish capable of reflecting 10 to 15 per cent of visible and infrared light.

Although not a high shine compared with regular mirrors, these micromirrors, created in patterns, could provide useful contrast and readable information.

“These reflective nanotubes are bendable and stretchable, unlike other micromirrors, so they could be

applied to flexible electronics or in computer memories based on optics,” says Takahata. “Patches of bent tubes could represent 1s and erect ones 0s, and light could be used to read the data.”

By using carbon components in photonic chips, engineers could potentially increase processor speed dramatically and decrease the amount of energy required to cool electronics. The patterning technique could also be used to form thermal circuits in carbon nanotube forests, providing a new path to more effective heat dissipation from microprocessors.

Potential new bendy microelectronics applications include interactive wallpaper, programmable conference posters and even wearable-clothing displays. The flexible nature of nanotube mirrors may also open up new application opportunities in optical sensors, which could prove promising for medical applications. ■

Research findings published in Applied Physics Letters Volume 101/Issue 6.

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RESEARCH

Researchers tap into CO₂ storage potential of mine waste



Prof. Michael Hitch finds value in mine waste rock.

It's time to value the greenhouse gas-trapping potential of mine waste and start making money from it, says UBC mining engineer and geologist Michael Hitch.

Hitch, assistant professor at UBC's Norman B. Keevil Institute of Mining Engineering, studies the value of mine waste rock for its CO₂-sequestration potential, or "SP." He says mining companies across Canada will, in future, be able to offset CO₂ emissions with so-called SP rock and within 25 years could even be selling emissions credits.

Digging, trucking and processing make mining an energy-intensive industry that emits greenhouse gases. However, mine waste rock that is rich in the mineral magnesium silicate has an inherent ability to react with CO₂ and chemically fix it in place as magnesium carbonate — an ability that can be greatly enhanced with some processing. Hitch and his colleagues note that this capacity for CO₂ fixation can be five to 10 times greater than total greenhouse-gas production from some mine operations. Nickel, diamond, copper, chromite, platinum, palladium, talc and asbestos mines could all be contenders. Some large mines, the researchers add, could fix five million tonnes or more of CO₂ per year.

"I don't like waste," asserts Hitch. "I like to see efficient use of the resources."

Instead of using just one per cent of the materials from a big mining pit, he explains, a company could

receive value from the non-commodity rock. "All of a sudden this material starts having value, and it starts taking on a position in the company's cash flow as a by-product," says Hitch, adding, "It really kind of changes the dynamics of the mining operation."

With the global price of carbon-emissions credits expected to rise, SP rock could become even more valuable.

However, to achieve substantial CO₂ sequestration in SP rock, the somewhat sluggish chemical reactions that naturally fix CO₂ require a jump-start.

Researchers working with Hitch on this problem include UBC's Greg Dipple and Ulrich Mayer of Earth, Ocean and Atmospheric Sciences, and Gordon Southam of the University of Western Ontario. The collaboration is being funded by Carbon Management Canada, a Networks of Centres of Excellence that funds research to produce the technology, knowledge and human capacity that will reduce carbon emissions in the fossil-energy industry and in other large-scale emitters.

Two of the team's primary goals are to measure the rate of CO₂ fixation in mine waste rock and tailings in a laboratory setting and to speed up the process. Team members have already observed that CO₂ fixation is greatly accelerated in mine tailings, presumably as a result primarily of the large surface area exposed and available to react after rocks are crushed into small particles. ■

FACULTY

UBC's Master of Engineering in Clean Energy program receives boost from FortisBC

FortisBC recently pledged \$300,000 over the next three years to the Master of Engineering in Clean Energy program in the UBC Clean Energy Research Centre (CERC). The funding will support student co-op placement in industry, student projects and program delivery. The program — the first of its kind in Canada — focuses on advanced training related to energy-efficient technologies to reduce electricity use and fossil-fuel emissions while working to meet increasing global energy needs.

"The master's program in clean energy engineering is a tremendous step forward in supporting the province and industry in B.C. to reach ambitious clean energy goals," said Prof. David Wilkinson, director of CERC. "We are extremely pleased to partner with FortisBC in supporting this vital program."

FortisBC is one of British Columbia's leading energy suppliers, providing electricity, natural gas, propane and other renewable forms of energy. FortisBC's partnership in the program will provide opportunities for students to work side-by-side with industry to address sustainable energy challenges. In the 16-month program, students will focus on energy conservation, social-change concepts, efficient use of electricity and methods for comparing and evaluating alternative energy scenarios.

"Working with UBC to train skilled workers for B.C.'s future in this innovative program is a natural fit," said Doug Stout, Vice President, Energy Solutions and External Relations for FortisBC. "As a provider of natural gas and integrated energy solutions, we encourage a culture of energy efficiency and sustainability. We've heard the call from universities to industry to provide opportunities for skilled workers, and we look forward to seeing these students apply their training to achieve sustainable energy solutions." ■

For more information about the Master of Engineering in Clean Energy program, please visit www.cerc.ubc.ca.

CAREER ADVICE

Salary and contract negotiation for engineers

It can seem deceptively straightforward, but salary and contract negotiation must be considered carefully to avoid settling for less than your peers.

Start by determining the general compensation range for the position type. This varies by sector, experience level and geographic region. The APEGBC Compensation Survey, available on the APEGBC website, is an excellent resource that provides data on salaries of engineers and geoscientists in B.C. sorted by sector and experience level. You can also check advertisements in your area that provide starting-salary scales.

It is also important to understand non-merit factors that may unintentionally be factored into your starting offer. Gender-based pay inequities still occur within the profession. Preliminary analysis has shown that, in general, new graduates receive similar salaries regardless of gender, but that salaries diverge at senior levels.

Understanding basic negotiating strategies is the final step for success. Do not be the first one to suggest a

salary figure – if you suggest the number, negotiations will only bring it down. If they suggest the number, it can only rise. Also ensure you consider — and discuss — the entire compensation package, including benefits, vacation, professional development allowances, work flexibility, travel requirements and other provisions. Ensuring that you start in a strong position is important, as pay raises in many sectors are capped to a percentage of salary.

Engineers practicing in B.C. should be aware that the Employment Standards Act (31)(f) specifically excludes registered P.Eng. and E.I.T. professionals from all provisions of the act. This means you have no automatic protection with regards to hours of work, entitlements, parental leaves or other provisions. You must include all such provisions in your contract to be guaranteed such benefits. ■

Professor Elizabeth Croft, Ph.D., P.Eng., NSERC Chair for Women in Science and Engineering (BC/Yukon) will be speaking at an APEGBC MAPS Salary Seminar at UBC Vancouver on February 27. Details at www.wwest.ca.

By: Jennifer Pelletier, with files from Dr. Elizabeth Croft.

May 10 & 11, 2013 | www.wwest.ca/cc | University of British Columbia, Vancouver



Creating Connections: Working Together to Transform our World

A conference to support and enable a meaningful dialogue about the role of women in science, engineering and technology, and build capacity for individuals and organizations to engage in transformative and long-lasting change.

Featuring

- ◆ Friday night networking reception and public keynote;
- ◆ Personal and professional development sessions and three keynotes on Saturday;
- ◆ Opportunities for structured discussions and dialogue;
- ◆ A program for everyone who wants to be part of the discussion, inclusive of all genders, backgrounds and professions.

Featured Saturday Keynote: Dr. Roberta Bondar

Neurologist, scientist, educator, author, photographer and Canada's first female astronaut



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PHOTO BY MARTIN DEE



STUDENTS

Clean Energy Engineering project studies campus water usage

Adriana Velazquez completed her undergraduate degree in mechanical engineering in Mexico City and was always intrigued by sustainability and “green” power. After researching various master’s programs and universities — and running a marathon in Vancouver — she fell in love with UBC’s Master of Clean Energy Engineering program, and the city of Vancouver.

Velazquez is in her last term of the program, which requires a clean energy research project and report. After hearing a presentation from University Neighbourhoods Association (UNA), Velazquez began researching the benefits of sub-metering — meters that measure water usage of each housing unit within an apartment building.

Apartment buildings’ meters typically collect the entire building’s water usage, and building administrators then divide the cost by the number of units and bill each one respectively. However simple, this method doesn’t encourage tenants to use less water or inform them on how much water they are using.

By working alongside the UNA and UBC Properties Trust, Velazquez will monitor water usage on the UBC Vancouver campus to compare three different kinds of metering and the impacts on customer water-consumption habits.

To compare the impacts of different types of metering, apartments in the first study group are sub-metered for hot and cold water and tenants are given information for their consumption rates, but are not billed for direct usage. The second group is informed and billed directly based on their hot-water consumption rates. The third group will continue the typical method that meters and divides the entire building’s water consumption without providing specific user information.

Velazquez’s research into similar studies has found that people use significantly less water when they are being billed directly for their water usage. Her three-month project finished in December, and she expects the results to reflect these findings.

“I want this to be a starting point for a bigger project,” she says. One advantage of the Clean Energy master’s program is that it allows Velazquez to take advantage of its resources and connections to develop her project.

By partnering with UBC Campus Sustainability’s Social Ecological Economic Development Studies (SEEDS) program; its manager Brenda Sawada; and other partners, including Chadwick Choy from the UBC Properties Trust, Ralph Wells from the UNA and Kyle Rees from Campus Sustainability, Velazquez gained project expertise and a mentorship throughout the process.

The partnership allows Velazquez’s project to become a part of the bigger sustainability movement on campus, with her research being added to the SEEDS library. The connections she develops within the campus community will amplify the impact of her work far beyond the scope of a class project.

Velazquez received an AMS Sustainability grant worth more than \$6,000, which will go to support project costs. As part of her commitment with the AMS Sustainability Office, she also maintains a blog to report the project’s progress.

She received guidance from a mentor from FortisBC, benefiting from the connections between her program and local industry. “I think the more people involved from industry, the more enriching the experience will be.”

Velazquez credits her UBC Instructor, Eric Mazzi (PhD ’10 RMES), for helping her realise the benefits that she and UBC graduate students have to offer employers and industry partners; and in turn, recognizes the benefits students receive from industry.

“They provide expertise in the field and a real-world perspective of how things work,” she says. ■



From left: Robb Price and Brent King partner on the Got Ginch drive.

ALUMNI

Alumnus Brent King gives back to Canada's communities — one pair of underwear at a time

One motorhome, two men, eight days, masses of contributors...and dignity back to the streets.

Brent King graduated from UBC with a BAsC in mechanical engineering in 1996 and combined it with his degree in biology from the University of Calgary to forge a very successful career in biomedical design. He started his first company — Metron Biomedical — with UBC classmate Ian MacDougall before he left UBC. After a stint working for Pyng Medical, he moved to Calgary and joined TENET, eventually becoming a co-owner and then selling the company in 2011 to Smith and Nephew.

King continues to work for Smith and Nephew today — but five years ago, he realized something that has subsequently enriched his life and the lives of thousands of people across Canada.

"I wanted to give back," he recalls. "And I had been doing so through donations to charities, but I wanted to do more. I had resources and talents that might be useful in solving problems — so I set out to find a problem to solve."

He started at random, calling the Mustard Seed in Calgary, a charity that helps transition people off the

streets. While perusing their website's donation wish list, King observed that they needed men's underwear more than anything else. Used clothing donations, explained the Mustard Seed, never contain underwear, which is one of the things people give up on the street and often the first thing people need as they transition back.

However, after a visit to the local department store, King realized that thousands of pairs of underwear would be expensive, so he approached his contacts. He found a textile company that agreed to help if he expanded the drive to include a shelter in Vancouver. Friends joined in — with the agreement that shelters in Edmonton would also benefit. King decided to send a blanket email to all his contacts, asking for support and offering to deliver underwear as far across the country as that support would take him. That year, he raised enough to reach Halifax and distributed 25,000 pairs of underwear to cities across Canada.

Now in its fourth year, the "Got Ginch" drive delivered 35,000 pairs of underwear to shelters across Canada over the summer of 2012 and, for the first time, included 5,000 pairs of women's underwear. King makes the drive with Got Ginch partner Robb Price to 10 cities across Canada in a packed motorhome in eight days — it's as much time as he can spare from his family and his work. "All of our expenses are donated," he says. "People donate their time if they can't donate their money." King donates two plane tickets home from Halifax for himself and Robb.

In his first year, an accompanying videographer made a documentary, called *One Problem*, which serves as a reminder that if each person took on one problem, the bigger problems society faces collectively would lessen. It may seem like a small solution, but 40,000 people in Canada this year will be better off because of the efforts of King and the many people who contribute to the Got Ginch drive.

As King rightly notes, "Nothing says dignity like clean underwear." ■

To find out more about next year's Got Ginch drive, as well as ways you can support and get involved, please visit <http://gotginch.ca/>.

Awards & Achievements

UBC Engineering Co-op Program Director **Jenny Reilly** has won the UBC President's Staff Award for her excellence in global citizenship, as well as the Meritorious Service Award from the Canadian Association for Co-operative Education (CAFCE) in recognition of her work as Chair of CAFCE's Accreditation Committee and her work on accreditation guidelines for Canadian co-op programs over the past several years.

Chemical and Biological Engineering Professor **Xiaotao (Tony) Bi** (PhD '95 CHEM) received the Particulate Solid Research Inc. (PSRI) Lectureship Award from the American Institute of Chemical Engineers (AIChE) for his outstanding contributions in the field of fluidization and fluid-particle flow systems.

Chemical and Biological Engineering Professor **John Grace** received the DuPont Particle Technology Forum Award from the American Institute of Chemical Engineers for a lifetime of outstanding contributions in research and education in chemical engineering and for being a leading researcher in fluidization and multiphase systems; and he received the 2012 Montreal Medal from the Chemical Institute of Canada for his significant leadership in the profession of chemical engineering in Canada and his outstanding contributions to the field.

Chemical and Biological Engineering Professor **Kevin Smith** received the Canadian Catalysis Lectureship Award for 2012 from the Catalysis Division of the Chemical Institute of Canada.

Civil Engineering Professor **Jonathan Fannin** received the 2012 Geosynthetics Division Award from the Canadian Geotechnical Society in recognition of his outstanding technical contributions to the application of geosynthetics in civil, geotechnical and geoenvironmental engineering in Canada and internationally.

Civil Engineering Professor **Michael Isaacson** was appointed President of the Association of Professional Engineers and Geoscientists of BC for a one-year term, effective Oct. 27, 2012.

Civil Engineering Professor **Dharma Wijewickreme** (MAsc '86, PhD '90 CIVL) was appointed Vice President Finance of the Canadian Geotechnical Society for a two-year term, effective January 1, 2013.

Civil Engineering Assistant Professor **Mahdi Taiebat** and co-authors were awarded the Norman Medal of the American Society of Civil Engineers — the highest honour it grants for a technical paper that makes a definitive contribution to engineering science. Their paper "SANISTEEL: Simple Anisotropic Steel Plasticity Model" was published in the February 2011 issue of the ASCE *Journal of Structural Engineering*.

Electrical and Computer Engineering Professor **Tyseer Aboulnasr** received the Queen Elizabeth II Diamond Jubilee Medal from the Ontario Lieutenant Governor, for significant achievement and remarkable service.

Electrical and Computer Engineering Professor **Vijay Bhargava** and Computer Engineering PhD candidate **Hamidreza Boostanimehr** won the Best Paper Award at the 2012 IEEE International Conference on Communications for their paper, "Outage Analysis and Relay Allocation for Multi-stream OFDM Decode-and-Forward Rayleigh Fading Networks," which examines the outage behaviour of cooperative systems.

Electrical and Computer Engineering Adjunct Professor **Jim McEwen** (BAsc '71, PhD '75 ELEC, DS '11) was recognized with the Order of Canada for his contributions to biomedical engineering, notably as an inventor and entrepreneur.

Materials Engineering Professor and Department Head **Warren Poole** was reappointed as the Rio Tinto Alcan Chair in Materials Process Engineering for another five-year term, effective July 1, 2012.

Mechanical Engineering Professor Emeritus **Muhammad Iqbal** received the Queen Elizabeth II Diamond Jubilee Medal from Member of Parliament for Vancouver Quadra Joyce Murray for his humanitarianism and philanthropy.

Physics Professor **Jeff Young** (BAsc '79 ENPH) was appointed director of the UBC Advanced Materials and Process Engineering Laboratory (AMPEL) for a three-year term, effective July 1, 2012.

UBC Okanagan School of Engineering Assistant Professor **Lukas Bichler** has received the national Brimacombe Award from the Metallurgy and Materials Society, which recognizes young achievers who bring people together to collaborate on innovative research and significantly advance research in the field of materials science. The award was created in honour of the late Keith Brimacombe of UBC.

Alumni Updates Event Highlights



CIVL '62 50TH REUNION

SEPTEMBER 12-13, 2012

The Civil Engineering Class of 1962 gathered for a two-day 50th Reunion in September. The event started with a red sweater stag luncheon at the UBC Golf Club. In the evening, a cocktail party for classmates and guests was hosted by classmate Jim Shepard at his home, and UBC President Stephen Toope dropped by to meet the grads. The next day began with a tour of the Civil Engineering Department, followed by a campus walk to observe some of the changes to the campus over the past 50 years. The final event was held at the Royal Vancouver Yacht Club, where a total of 49 classmates and spouses dined and enjoyed hours to reconnect and reminisce. Approximately two-thirds of the '62 grad class attended the reunion, with classmates attending from as far away as Britain and Kansas. All who attended provided their "Life Histories," which were compiled into a document as a memento, making for both humorous and interesting reading. The reunion committee, consisting of Don Reid, Dave Snead, Alex Woods and George Edson, thank Jim Shepard for his generosity in hosting the cocktail party and fellow committee members for their hard work and help in organizing. The reunion was such a success that another in five years is contemplated!

SUBMITTED BY DAVE SNEAD BASC '62 CIVL.
PHOTO BY JOHN WATSON BASC '63 CIVL.

CIVL '87 25TH REUNION BBQ!

SEPTEMBER 15, 2012

The Civil Engineering Class of 1987 gathered under sunny skies at the Royal Vancouver Yacht Club for a BBQ in mid-September. Class members travelled from as far as Singapore for the event. It was great to catch up, and we plan to gather again in 2017.

SUBMITTED BY RON MONK MENG '87 CIVL.



CIVL '49 REUNION

SEPTEMBER 19, 2012

The 1949 Civil Engineering class gathered at the Hollyburn Country Club to celebrate their 63rd Reunion! Year after year, Knute Soros leads the group-organizing process, and we thank him for his tireless efforts. Attendees enjoyed a wonderful meal, great conversation and a roundup discussion about their ever-growing Civil '49 bursary.

TRI MENTORING KICK-OFF EVENT

OCTOBER 17, 2012

On October 17, 2012, the UBC Engineering Mentoring Program hosted its annual kick-off event for our 229 program participants. This program connects a junior and senior student with an industry professional to facilitate student learning regarding career development and workplace expectations. This year's program, the largest in our 11-year history, welcomed 79 industry mentors, 41 of whom are UBC alumni, as well as 150 students. This event marked the official launch of the program and allowed mentors and students to meet for the first time and practice their networking skills. Please note that mentor recruitment takes place each year at the end of August. For more information about the program, please visit <http://students.engineering.ubc.ca/professional-development/mentoring-program/>.

TORONTO ALUMNI RECEPTION

NOVEMBER 1, 2012

Dean Pro Tem Eric Hall hosted a reception in Toronto for local alumni. The Irish Embassy Pub in Toronto was the place to be, despite the threats of terrible weather from the looming Frankensorm. Over 20 alumni attended to chat and mingle with the dean and with co-op students working in the area. Thank you to the alumni and friends who came out — we hope to see you all at other Toronto UBC events!



ECE STUDENT AND ALUMNI NETWORKING NIGHT

NOVEMBER 6, 2012

The ECE Undergraduate Student Society held their first Student and Alumni Networking Night at the Manchester Public Eatery. Students were provided with alumni bios and a few starter questions to help them interact with alumni. Over 25 ECE alumni came out to chat with students, talk about their experiences in the world and workplace and offer advice to upper-year undergraduates. It was a successful first-time event, and we look forward to seeing it grow in the years to come.

CIVL '75 REUNION: EVERY 10 YEARS IS NOT ENOUGH

NOVEMBER 16, 2012

The Civil Engineering Class of 1975 has been holding an annual pre-Christmas reunion since 1982. It began on the first snowy December night when Don Brynildsen and Ivan Campbell got together for a beer to wait for the traffic mess to clear before going home. The idea came up to do this every year and invite the whole class of '75. Over the years the numbers have varied from five to about 25, and in recent years, several of the members who had not been involved in the early years have come out for the get-together. We always toast our two members who have passed on. We have mentioned this annual reunion to engineers from other classes and graduating years, and most are amazed, generally saying their classes rarely get together. Maybe we were fortunate that our members were friends as well as classmates. Maybe we just like to party. Whatever the reason, we will keep it up until there are none of us left.

SUBMITTED BY DON BRYNILDSEN BASC '75 CIVL.

Upcoming Events

Here's a snapshot of some upcoming events, but there will be more. Visit our web calendar or subscribe to our monthly e-newsletter at www.apsc.ubc.ca/news-events/newsletters.

UPCOMING EVENTS

ENGINEERING CO-OP GRADUATION RECEPTION MARCH 5, 2013, 6-10 P.M.

The Engineering Co-op Graduation Reception will be held at the Marriott Pinnacle Downtown Hotel, located at 1128 West Hastings Street, Vancouver.

BIOMEDICAL GRAND ROUNDS SERIES 2012/13 MARCH 6, 2013, 7-8 A.M.

This event will be held at the Gordon and Leslie Diamond Family Theatre, on the main floor of the BC Cancer Agency Research Centre with Mehdi Moradi, PhD, assistant professor, Electrical and Computer Engineering. BME Grand Rounds are open to any interested parties. Current updated information can be found at www.bme.ubc.ca/news-events/.

CANADIAN ENGINEERING COMPETITION 2013 - CARLETON UNIVERSITY MARCH 7-10, 2013

Entering its 28th year, the Canadian Engineering Competition (CEC) showcases the skill and innovation of engineering students from across the nation. A valuable opportunity for industry participation and support, competition themes are based on real-world case studies. For more information see www.cec2013.ca/en/.

CAPSTONE DESIGN CELEBRATION APRIL 2013

The Mechanical Engineering Capstone Design Celebration is a showcase of student senior design projects and includes displays and prototypes. The event will be held at the Wayne and William White Engineering Design Centre, Vancouver.

ENGINEERING EXCELLENCE APRIL 10, 2013

The fourth Engineering Excellence Celebration will take place on April 10. Come and help us celebrate the best in UBC Engineering. Awards are presented for community service, lifetime achievement, young alumnus, future alumnus and professor emeritus.

CREATING CONNECTIONS: WORKING TOGETHER TO TRANSFORM OUR WORLD MAY 10-11, 2013

Creating Connections: Working Together to Transform Our World is a biannual regional conference focusing on gender diversity in science, engineering and technology in B.C. and Yukon held at UBC Vancouver www.wwest.ca/cc.

UPCOMING ALUMNI EVENTS

UBC CSCE STUDENT CHAPTER INDUSTRY NIGHT JANUARY 24, 2013

Each year, the Canadian Society of Civil Engineers (CSCE) - UBC Student Chapter hosts an Industry Night that allows students to meet and network with employers and industry representatives. In addition to meeting aspiring civil engineers, employers and representatives will have the opportunity to speak briefly about their companies, job opportunities and interesting projects.

GEOLOGICAL ENGINEERING ALUMNI & INDUSTRY DINNER JANUARY 25, 2013

UBC Geological Engineering cordially invites alumni and friends to attend the 11th annual Geological Engineering Alumni/Industry Dinner held at the UBC Golf Club. Please join us for an evening of networking with industry and the next generation of UBC Geological Engineers!

UBC ALUMNI RECEPTION AT ROUNDUP 2013 JANUARY 29, 2013, 5:30-8:00 P.M.

Join us for a drink and some appetizers prior to your evening engagements at Roundup2013! Reconnect, mingle and meet with fellow delegates from UBC's Engineering and Science faculties. To RSVP, email sarah.barclay@ubc.ca.

MINING ALUMNI DINNER FEBRUARY 2, 2013

Join fellow Mining alumni at the 17th Annual Mining Alumni Dinner. This year's not to be missed event at the Four Seasons Hotel will feature Keynote Speaker Bill Weymark. Tickets can be purchased online at www.regonline.ca/ubcmineralumnidinner2013. RSVP deadline: January 25, 2013.

OLD RED NEW RED FEBRUARY 7, 2013

One of the year's most anticipated events is back! Old Red New Red brings together alumni and students to share stories, hear from the dean of Applied Science and meet up with old and new friends. Don't forget to wear your red! To RSVP, email sarah.barclay@ubc.ca.

UBC MINING RECEPTION - DENVER, CO FEBRUARY 25, 2013

UBC Mining will be hosting a reception for alumni attending the SME Annual Meeting and CMA National Western Mining conference or for those who live in the Denver area. Please keep an eye on your inbox for an invitation or contact sarah.barclay@ubc.ca if you would like to reserve a spot.

UBC ENGINEERING ALUMNI RECEPTION, TORONTO MARCH 4, 5:30-8:00 P.M.

UBC Engineering and the Faculty of Science will be hosting a reception for UBC Alumni attending the Prospectors & Developers Association of Canada (PDAC) conference in Toronto. To register and reserve your space, email sarah.barclay@ubc.ca.

3CC - THREE COURSE CONNECTION MENTORING DINNER MARCH 7, 2013

Organized by students, this mentoring dinner is designed to bring together students and alumni from Applied Science, Arts and Commerce. The 3CC dinner is a fantastic way for alumni to provide mentorship to students from different disciplines and facilitate relationship building over a three-course meal. If you are interested in becoming a mentor for this one-night event, email courtney.smith@ubc.ca.

UBC DESERT DAYS, PALM DESERT, CA MARCH 10 - 12, 2013

Whether you're a snowbird or a local, you're welcome to join UBC Alumni Affairs for this exciting week of activity in the warm and sunny desert. This is a time for alumni and supporters to gather and celebrate their shared UBC connection. For more information, please contact Nicola Wootton at nicola.wootton@ubc.ca.

WOMEN IN SCIENCE AND ENGINEERING

MARCH, 2013

The Women in Science and Engineering (WiSE) dinner connects industry mentors with female students in the Faculties of Applied Science and Science. This evening helps students to connect with mentors to gain advice to build satisfying and successful careers.

The event also enables mentors to promote their industries, network with other mentors, develop new skills and maintain a connection with the UBC community.

ENGINEERING STUDENT TEAM COUNCIL INDUSTRY NIGHT

MARCH 22, 2013

The Engineering Student Teams Council is hosting its first ever Student Teams' Showcase! Come and support the amazing students in UBC Engineering who dedicate their time and effort into designing and fabricating their projects, and competing across the world. Come see teams such as UBC's SAE AeroDesign, Baja and Formula, artificially intelligent soccer playing robots, micro satellites and fuel-efficient vehicles. Enjoy refreshments while connecting with some of UBC Engineering's finest students from various disciplines. Hear amazing stories about their projects and working with their teams. <http://ubcestc.wordpress.com/>

ENG PHYS SOCIAL NIGHT

APRIL, 2013

Engineering Physics will once again convene to celebrate student achievement, new graduates and their alumni community. Please save the date and watch your email for your invitation.

IGEN INDUSTRY NIGHT

APRIL 4, 2013

Industry professionals and alumni are invited to campus to take part in the Integrated Engineering (IGEN) Industry Night. Current students will display projects and achievements for members of the engineering community and will answer questions about their work.

CEEN STUDENT AND ALUMNI NIGHT

APRIL 25, 2013

Following the success of last year's inaugural event, we're happy to host the second annual Clean Energy Engineering (CEEN) Student and Alumni Night. This year's event will take place at UBC Robson Square. CEEN students, alumni, staff and faculty will meet, mix and mingle following the evening's speakers.

CHEM '70 REUNION

MAY 23-24, 2013

The CHEM '70 group are gathering for a reunion! Two days of events will include a trip to campus (and lunch at the pub!), golf at the University Golf Club and dinner at Seasons in the Park. Please contact Anthony Galloway at aj.galloway@telus.net for more information.

ALUMNI WEEKEND

MAY 25, 2013

Save the date! This year's campuswide UBC Alumni Weekend will take place and UBC Engineering will host our annual Engineering Reception — all alumni and guests are welcome! To commemorate important anniversaries, we will be taking class photos of milestone reunion years — calling all grads of 1953, 1963, 1973, 1983, 1988, 1993 and 2003! This year promises to be a particularly great event, as the Class of 1963 have already started their planning for a big 50th reunion blowout! For more information, visit www.engineering.ubc.ca/alumni.

BASC '63 REUNIONS

MAY 25, 2013

John Montgomery (BASC '63, EUS President '63) and the department presidents have been busy putting together an all-department reunion weekend to celebrate the 50th anniversary of the BASc Class of '63. Please contact John at jsrmont@telus.net for more information.

BIO RESOURCE ENGINEERING ALUMNI CELEBRATION

MAY 25, 2013

UBC Bio Resource Engineering alumni are invited back to UBC for an all-years get-together during Alumni Weekend. Watch your mailbox for your invitation and more information. Contact Courtney Smith at: courtney.smith@ubc.ca for more information or to volunteer for the planning committee.

MINE '73 REUNION

MAY 25-26, 2013

The Mining class of '73 will be holding their 30th reunion during Alumni Weekend. Details are currently being finalized but alumni are asked to contact Michael Allan, reunion organizer, at Michael.Allan@teck.com for more information.

REUNIONS

For more information on upcoming reunions, or if you are interested in organizing a reunion, please email courtney.smith@ubc.ca in the Alumni Relations office.



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