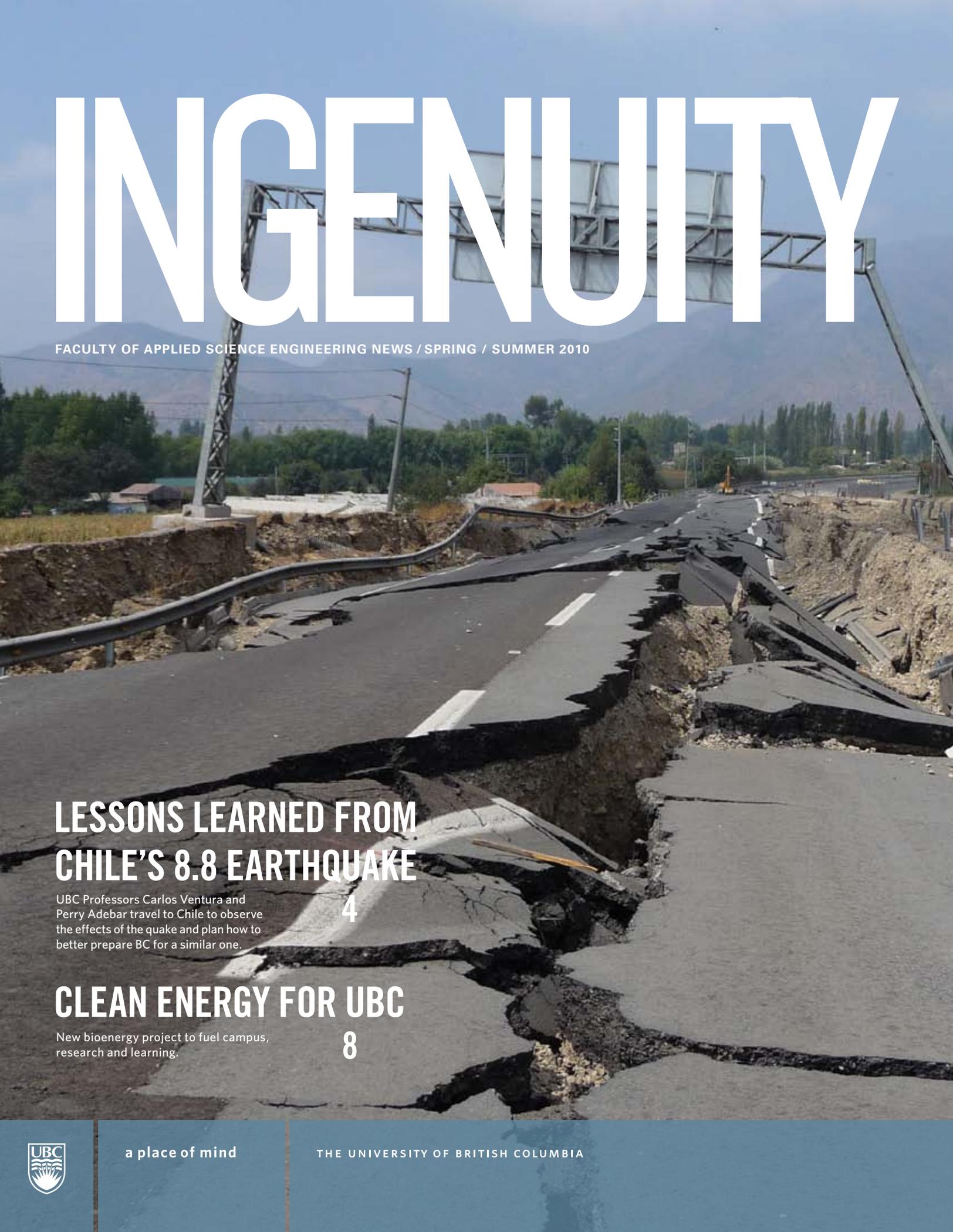


INGENUITY



FACULTY OF APPLIED SCIENCE ENGINEERING NEWS / SPRING / SUMMER 2010

LESSONS LEARNED FROM CHILE'S 8.8 EARTHQUAKE

UBC Professors Carlos Ventura and Perry Adebar travel to Chile to observe the effects of the quake and plan how to better prepare BC for a similar one.

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CLEAN ENERGY FOR UBC

New bioenergy project to fuel campus, research and learning.

8



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA



PHOTO: ERIN JANSZPANKO

Dean's Message

Taking a moment to reflect upon this past term and year within the Faculty of Applied Science, we've experienced very joyous moments — the School of Engineering at the Okanagan campus graduating its first class and receiving accreditation, our first annual Engineering Excellence Celebration to recognize the contributions of alumni and future alumni and Canada's Olympic success, supported by our Own the Podium research, to name just a few. And we've experienced a truly sad moment — the untimely passing of one of our top faculty members, Professor Chad Bennington, a young star who has truly left his mark on the pulp and paper industry, revolutionizing how it runs, and in the process, ensuring the continued success of many companies and the continued employment of many in B.C. The sudden loss has left his many students, his colleagues in the Pulp and Paper Centre and the Department of Chemical and Biological Engineering and everyone who was touched by his passion, myself included, in a true state of shock. Hundreds of students, colleagues and friends paid their respects in a service that highlighted Dr. Bennington's passion for his family, his work and life in general.

The external news in the past months has been dominated by earthquakes, oil spills, dam failures and the resulting devastation. Throughout, we are reminded of the huge responsibility on our shoulders to ensure that the systems we design are guaranteed to operate safely, even after system failures. We are equally reminded of the incredible work engineers do to mitigate the damage that results from natural disasters, as well as disasters resulting from failures in our own designs. Learning from our mistakes, we must work harder to ensure we continue to be worthy of the responsibility society has placed on our shoulders. It is a tremendous responsibility and one that our people — faculty, students, and most importantly, our professional engineering alumni — take very seriously.

This issue highlights the contributions of many of our people who individually and collectively have left their mark on our world. To share other stories of fellow alumni who have made a difference, or to comment in any way on this edition of *Ingenuity*, please feel free to email me at dean@apsc.ubc.ca.

Tyseer Aboulnasr, P. Eng.
Dean, Faculty of Applied Science

"Learning from our mistakes, we must work harder to ensure we continue to be worthy of the responsibility society has placed on our shoulders."

Dean Tyseer Aboulnasr

To view past issues of *Ingenuity*, visit:
www.engineering.ubc.ca/publications

UBC ENGINEERING AT A GLANCE*:

215	Faculty (full-time tenure track faculty and lecturers)
4,416	Undergraduate students
640	Undergraduate degrees awarded
1,197	Graduate students
263	Graduate degrees awarded
16	Canada Research Chairs
8	Endowed Chairs
1	NSERC Design Chair
4	Industrial Research Chairs

* statistics compiled from academic year 2009–2010

Engineering

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Chemical and Biological Engineering
Civil Engineering
Electrical and Computer Engineering
Engineering Physics
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Geological Engineering
Integrated Engineering
Materials Engineering
Mechanical Engineering
Mining Engineering
School of Engineering

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Centre for Instructional Support
Centre for Professional Skills Development
Development and Alumni Relations
Engineering Co-op Office

THE FACULTY PARTICIPATES IN SEVERAL RESEARCH CENTRES AND LABORATORIES, INCLUDING:

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Clean Energy Research Centre (CERC)
Institute for Computing, Information and Cognitive Systems (ICICS)
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Printed in BC, Canada, on a Forest Stewardship Council certified paper that is 100% recycled. A total of 183 kilograms of greenhouse gases (GHGs) were emitted during the transportation of the paper. These GHG emissions together with GHGs emitted during the printing process of *Ingenuity* will be offset through investments in energy efficiency and non-fossil fuel technologies.

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ENGINEERING RESEARCH

LESSONS LEARNED
FROM CHILE'S 8.8EARTHQUAKE
WHAT IT MEANS FOR B.C.

On February 27, 2010, a magnitude 8.8 earthquake shook Chile. Intense shaking lasted for about two minutes. Approximately 500 people died, at least 100 went missing and approximately 800,000 were injured or displaced. Damage is estimated at \$30 billion.

The fifth largest earthquake ever recorded by seismographs, the quake was a subduction earthquake, caused by up to 13 meters of eastward slip of the Nazca plate beneath South America. The rupture zone extended nearly 800 kilometres along the Chile coast and covered the most populated region of the country — extending from south of Concepción to just south of Valparaiso (near the latitude of Santiago).

British Columbia sits along a similar fault, the Cascadia subduction zone — which stretches from Vancouver Island to northern California — where the Juan de Fuca and North America plates converge. Experts believe the Cascadia region is due for a larger, more devastating earthquake than the one in Chile — perhaps as high as magnitude 9, which could produce severe shaking for up to five minutes.

A few days after the 8.8 quake, a Canadian reconnaissance team went to Chile and traveled through the country from Santiago to Concepción to observe the effects of the quake and its resulting tsunami on buildings, bridges, schools and hospitals. The team was led by UBC Civil Engineering Professor Carlos Ventura and included Professor Perry Adebar.

The brand-new, 14-story Alto Rio apartment building in Concepción still had units remaining for sale prior to its collapse.

PHOTO CREDIT: PERRY ADEBAR



Professors Perry Adebar (left) and Carlos Ventura inspect a concrete block wall recently tested in the UBC Structures Laboratory to prepare British Columbia for future earthquakes.

"It's typical in the engineering community to gather information from real-life occurrences," says Ventura, Director of UBC's Earthquake Engineering Research Facility. "With construction and tsunami concerns similar to those of British Columbia, this earthquake provides a real-life laboratory, revealing the consequences of engineering decisions. Earthquakes expose flaws in design, so there are many lessons to be learned."

The experts asked two questions: Why did particular structures fail? And why did other, seemingly similar structures nearby not fail?

Adebar, an expert in high-rise concrete buildings, chairs the committee on seismic design of concrete structures for the Canadian building code; he will use

the knowledge gained to better inform the development of Canada's future codes. The next code will be published in 2014.

"Few buildings in Chile actually collapsed, and relatively few people were killed, so in that regard, the buildings, which are mostly made of concrete there, performed extremely well," says Adebar. "But, surprisingly, many brand-new buildings were badly damaged, leaving thousands of people homeless. The question of why so many brand-new buildings were damaged needs to be answered."

Adebar found common features among damaged buildings. Many of the newer buildings had thinner walls and columns, which he suspects have a propensity to deteriorate more quickly under continued shaking. Adebar and some of his graduate students are conducting tests at UBC this summer to investigate whether this is an important part of the explanation for the damage to new buildings.

Another observation Adebar made was that many irregular buildings — those with small windows on some sides and mostly glass on the others, for example — were badly damaged. These buildings have an uneven distribution of stiffness, which causes such buildings to twist, resulting in more damage on one side. "Earthquakes always find the problem with the design," says Adebar.

"In their design calculations, engineers typically ignore the nonstructural facade of a building, but some facades are stiff and can significantly affect the structural response of a building during an earthquake," he adds. "Architects and building owners want their buildings to be unique, but complex architecture greatly adds to the challenge of designing safe buildings."

The new buildings that were so badly damaged did meet the design objective of the current Chilean building code, which is similar to the current Canadian code. This makes Adebar question the performance objective of building codes: "Is it enough to ensure collapse prevention? Or should we be doing more to prevent the loss of people's homes?"

"Looking at the damaged buildings, I'd think, 'If the engineer had just had done this one thing different in the design, which would cost very little to do, the building would still be livable, rather than slated for demolition.' The problem is that our design methods are not sophisticated enough yet to allow us to spot that one change in the design. We still need the earthquake to point it out to us."

Professor Ventura's research interests include emergency preparedness and risk assessment of all infrastructure — including buildings, bridges, roads,



PHOTO CREDIT: PERRY ADEBAR

hospitals and schools — but he and Adebar converge on the topic of codes.

What should the desired performance objectives be? Modern building codes are meant to protect life; should they instead ensure future habitability and functionality?

In his infrastructure assessment, Ventura found 20 badly damaged bridges, with an estimated repair cost of about \$1 billion; damage to 2,750 schools — affecting 800,000 students — costing about \$1.6 billion; and 25 severely damaged hospitals that will cost \$2.5 billion. In the Maule region, hospitals lost nearly half their beds.

"Losing 45 per cent capacity to serve injured people during an emergency is unacceptable," says Ventura. "If you lose the ability to treat the injured, injuries can quickly become fatalities."

Ventura works extensively with British Columbia's Ministers of Education and Transportation; the information he gathered in Chile will help inform future decisions in the province.

"Schools in B.C. adhere to code for life protection. However, if buildings are ruined, they may become uninhabitable — which means that thousands of children cannot go to school," says Ventura.

Currently, over 700 schools in British Columbia are slated for earthquake retrofits.

"Understandably, the minister's role is to look after education, but we really must accelerate the program to ensure not only that lives are saved, but also to minimize the overall impact when a very large earthquake occurs," says Ventura.

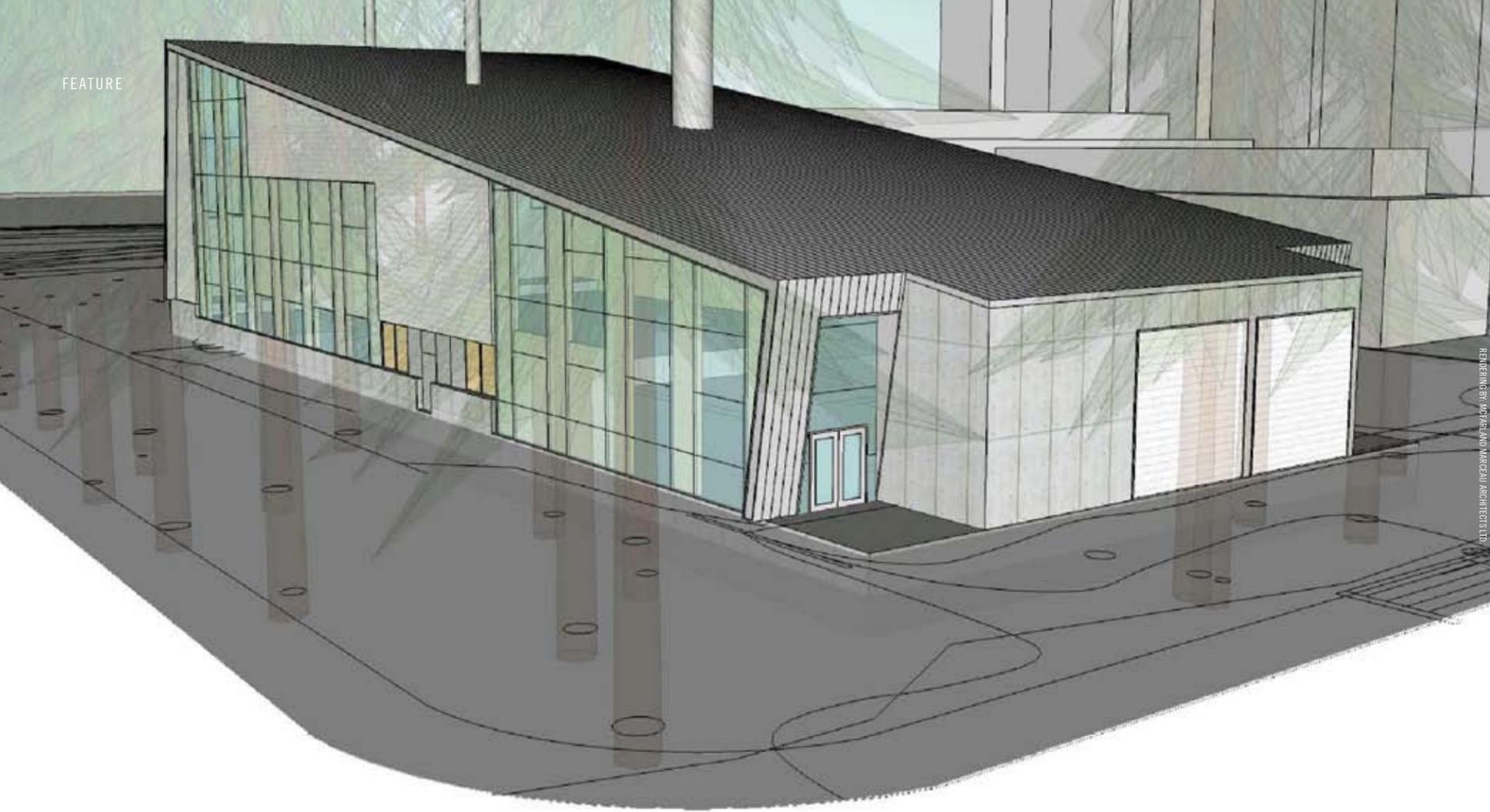
Both Adebar and Ventura also converged on their roles as engineers to help people.

"Wearing a hard hat and saying only 'el ingeniero Canada,' we were given access by the police and army to all the damaged buildings, and people living nearby would invite us into their homes to see the damage," says Adebar. "And they were very grateful when we told them their home was still safe."

Ventura adds that people he encountered were also very grateful. "'You came all the way from Canada to see us,' people would tell me. Not only were we collecting information, but as engineers, we were bringing a level of hope and reassurance."

The reconnaissance team has recently been featured in the Discovery Channel's "Monster Quake — Will We Survive?"

Residents were able to escape this badly damaged apartment building. B.C.'s infrastructure must be secured to minimize fatalities.



Artist's rendering of UBC's Bioenergy Research and Demonstration Project, which will break ground this fall.

Sometimes big ideas with tremendous impact start with small conversations. Such is the case with UBC's Bioenergy Research and Demonstration Project.

"The origin of the project was a conversation I had with Jonathan Rhone, President and CEO of Nexterra, an excellent local company that has developed a biomass gasification technology for heat and power," says Professor John Grace, former Acting Director of UBC's Clean Energy Research Centre (CERC). "There was an opportunity to have UBC, the company, and the environment benefit from collaborating on a demonstration project on campus. I was delighted that so many sectors of the university came together to realize the project."

The UBC Bioenergy Research and Demonstration Project will break ground this fall. It will generate enough clean electricity to power 1,500 homes; reduce the university's natural gas consumption by up to 12 per cent and eliminate up to 4,500 tonnes of greenhouse-gas emissions per year — the equivalent of taking 1,100 cars off the road.

B.C. Premier Gordon Campbell and UBC President Professor Stephen Toope announced the project, a partnership with Vancouver-based Nexterra and GE

Water & Power, in February. It will be the first North American demonstration of a new biomass-fueled heat-and-power application that combines Nexterra's gasification system with GE's Jenbacher engines. Biomass refers to renewable organic matter, such as wood or wood waste and organic components of municipal and industrial wastes.

"This project demonstrates UBC's leadership in sustainability and our concept of the campus as a living laboratory," says Toope. "This groundbreaking partnership is helping UBC achieve its sustainability goals through the convergence of research, operations and industry in the bioenergy sphere."

The project at UBC's Vancouver campus will include the complete biomass gasification system, research laboratories and a building made of a demonstration lumber product. The co-generation system will produce two megawatts of cost-effective clean electricity and will also generate enough steam to displace up to 12 per cent of the natural gas that UBC uses for campus heating. It will also provide research and learning opportunities for faculty and students, yield valuable new knowledge in the clean-energy sector and establish new global standards for bioenergy system performance.

ENGINEERING RESEARCH

CLEAN ENERGY FOR UBC

New bioenergy project to fuel campus, research and learning

"This innovative approach allows the accelerated development, demonstration and commercialization of clean-energy technology for domestic use and global export," says Professor David Wilkinson, CERC Director. "The UBC campus is a contained community, which allows better control and monitoring of installed clean-energy technologies; it provides an ideal analytical model for research and learning and will also provide municipalities with data to set better standards for future bioenergy operations."

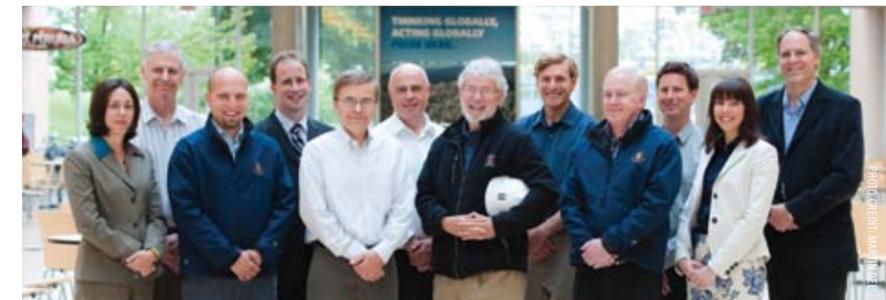
UBC research collaborators include CERC; the Institute for Resources, Environment and Sustainability; the Centre for Interactive Research on Sustainability; the Faculty of Applied Science; and the Sauder School of Business.

Funding support for the project comes from the BC Bioenergy Network, Natural Resources Canada's Clean Energy Fund, Sustainable Development Technology Canada, the Province of British Columbia, FPIInnovations and UBC.

UBC is one of the most sustainable postsecondary campuses in the world, earning top grade in the Sustainable Endowments Institute's College Sustainability Report Card. It is the first Canadian

university to announce it has achieved targets set by the Kyoto Protocol and to set bold greenhouse-gas reduction targets for the future.

"The project demonstrates that UBC is willing and able to work with local companies to do research and provide leadership in responding to important environmental issues," says Grace. ■



The following UBC people have played an active role in bringing the UBC Bioenergy Research and Demonstration Project forward:

From left, back: John Grace (APSc, CERC), David Woodson (Building Operations), Steve Cockcroft (APSc, CERC), Jeff Giffen (Building Operations, CERC), Aaron Mogerman (Infrastructure Development), David Wilkinson (APSc, CERC)

Front: Patricia Tewfik (Treasury), Jason Cantas (Building Operations), Ron Loewen (APSc), Andrew Collins (Infrastructure Development), David Rodgers (Building Operations), Andrea Wink (APSc)

Not pictured: John Robinson (Sustainability, CERC); James Tansey (Sauder School of Business, CERC); Brent Sauder (Office of the VP Research and International)



PHOTO © EDU: RUSSELL/MOULMIN

The School of Engineering's inaugural class graduates June 11, 2010.

HISTORY IN THE MAKING

School of Engineering graduates first class, receives full accreditation

On Friday, June 11, 2010, the School of Engineering at UBC's Okanagan campus made history.

Its first-ever graduates — a cohort of 56 students who began their studies in 2005 — received their Bachelor of Applied Science degrees in civil, mechanical and electrical engineering.

Rachael L'Orsa, graduating with a BAsC in mechanical engineering, spoke on behalf of her class.

"We have chosen professions in which each of us has the ability make an impact on individuals, where we have the power to work for the betterment and protection of people, places and species," said L'Orsa. "We are all bound by our experiences, by our commitment and by our achievement here today because we are all members of a community that begins here at UBC Okanagan and that will spread across the world as we seek our individual places within it.

"By attending the vibrant young campus of such a well-established, respected university, we have afforded ourselves phenomenal opportunities... We have also put ourselves in a unique position in which

we are history in the making... UBC Okanagan's reputation will be what we make of it."

Spiro Yannacopoulos, Associate Dean and Director of the School of Engineering, echoed L'Orsa's sentiments.

"The ultimate goal of the School of Engineering is to graduate people who will make a difference in the world. As a school, we will measure our success by the success of our graduates."

Thanks in part to a dedicated and diverse group of faculty, staff and industry professionals, Yannacopoulos is confident that graduating students have the tools they need to contribute to the engineering profession and the world.

"We hire faculty and staff who are extremely dedicated. With small classes, our professors are familiar with individual students," he said. "We have put together an innovative curriculum, and our professors are excellent researchers who keep up with the latest advancements in engineering science.

"Faculty members engage students in their research, which means undergraduate students have the opportunity to see the applications of the engineering principles they are taught in the classroom."

The program has built close ties with industry. In fact, the School of Engineering was established, in part, through the efforts of people in local industry. This year, fourth-year engineering students worked on projects submitted directly by industry through a mandatory Capstone Design Project course.

"Building strong relationships with the university is critical for our industry," said Dick Fletcher, P.Eng, and principal with Urban Systems Ltd. "We are strongly committed to supporting the development of engineering graduates. Their knowledge and skills will ultimately benefit the engineering profession and contribute to our ability to provide the services required to develop a sustainable society in a global economy."

Undergraduate student numbers have skyrocketed since the School's inception in 2005, increasing from 76 to 482. Today, the School has 36 master's students and 34 doctoral students; the graduate program has received hundreds of applications from all over the world.

To accommodate the ever-expanding group of students, faculty and staff, a brand-new \$68 million building will soon become home to the School of Engineering.

Major research-funding agencies — the Natural Sciences and Engineering Research Council and the Canada Foundation for Innovation — are also paying attention to what's happening at the School. Research grants for engineering this year reached more than \$4.8 million, up from \$40,440 in 2005.

And on graduation day, students and faculty learned that the School of Engineering received full accreditation from the Canadian Engineering Accreditation Board (CEAB).

"The School of Engineering's three programs have all received full accreditation for three years, which is the maximum accreditation period attainable for new programs," said Professor Alaa Abd-El-Aziz, Provost and Vice-Principal at UBC's Okanagan campus. "This achievement is the result of the hard work and dedication of many faculty, staff and students, in addition to

the leadership and direction from former Dean of the Faculty of Applied Science Michael Isaacson, current Dean Tyseer Aboulnasr, and the Director of the School of Engineering, Spiro Yannacopoulos."

"This is a significant achievement," says Dean Aboulnasr. "Accreditation indicates the strength of our programs and their acceptance within the professional community. We are very proud of what has been achieved by the School of Engineering over the past five years, its graduates and the support and excellent relationships we have with industry." ■

UBC Okanagan School of Engineering — At a Glance

	2005	Today
Undergraduate students	67	482
Master's students	0	36
Doctoral students	0	34
Faculty	5	33
Staff	1	8



Standing near the construction site of the future home of Engineering at UBC's Okanagan campus, Spiro Yannacopoulos, Associate Dean and Director of the School of Engineering, holds a small version of the "E" that has become an icon of this rapidly growing school.

PHOTO © EDU: BOB JACOBS

Newsworthy

STUDENTS

Community Service Learning



From left: Alvin Tse, Andrew Broun, Adam Gerber, Matthew Demeideiros and Megan Pate with planter table constructed in partnership with the YWCA for its rooftop food garden.

In our increasingly complex and globalized world, UBC Engineering students must learn to view their work within broad contexts and understand the implications of technology's impact on society and the environment. Applied Science has identified Community Service Learning (CSL) — an experiential approach to education — as a mechanism for reaching this objective.

CSL integrates service work with academics and reflection. Students utilize their knowledge and skills in response to community-identified priorities, and their service is linked to academic objectives. Structured reflection — such as oral presentations, journal writing or group discussion — challenges students to make connections between their studies and their community experiences.

When community service comes together with the application of classroom learning and critical reflection of theory and application, “it can be a powerful, transformative learning experience for both students and community partners,” says Alaya Boisvert, Community Service Learning Coordinator.

Working with community partners to generate, test and evaluate solutions has been shown to engender a sense of active citizenship and a sense of self-efficacy.

“Offering more CSL experiences within the curriculum will help broaden the professional skill set of our graduating engineers in areas such as leadership, critical thinking, creative problem solving and communication,” says Dean Aboulnasr. “It is crucial that our students understand that the technology they create will be used by humans to solve real problems. CSL experience provides students with a context for their technology.”

Senior Instructor Susan Nesbit introduced CSL into a technology and society course (APSC 262) in 2006-07. After witnessing the power of CSL to help students connect engineering to societal issues, she has become a strong proponent and integrates CSL into the second-year Civil Engineering curriculum.

Nesbit says, “Every student team puts tremendous effort into ensuring that their community-identified, sustainability-oriented project is completed to very high standards. In doing this, students begin to connect their knowledge and skills as engineers and informed citizens to the concerns of the broader community.”

Students in her courses tackled 21 community-identified projects, including designing and constructing a waste-themed prototype exhibit for Science World, a multipurpose shed for the Urban Aboriginal Community Kitchen Garden, and a biofilter for grey-water recycling and a wheelchair-height garden bed for YWCA's rooftop garden in Vancouver's downtown.

“Since our resources were greatly limited, we had to think through all our decisions very carefully as a team before we moved into construction,” says student Vasyl Odyegov. “We consulted extensively with experienced professionals, which confirmed for us that our final solution was the most rational and efficient. This was a unique opportunity to experience professional relations with other engineers, stakeholders and the public. We were able to bring something new to the world, made by our own hands.”

Students in the new Clean Energy Engineering graduate program recently worked on a Vancouver School Board project to reduce energy consumption. They performed energy audits at 11 schools and provided recommendations to the board.

If you have suggestions for community service learning projects or ideas for integrating with coursework, contact Alaya Boisvert at alaya.boisvert@ubc.ca or at 604-822-0493. ■

FACULTY

Civil Engineering partners with SNC-Lavalin to establish new position

The Department of Civil Engineering recently announced a new assistant professor position in Transportation and Infrastructure Planning, which will be held jointly with the School of Community and Regional Planning. The new position was made possible through a partnership with SNC-Lavalin, which is contributing \$250,000 over five years toward the professorship.

The new assistant professor will bring an interdisciplinary approach to solving urban problems, including land use, transportation systems and civil infrastructure — increasingly complex problems that result from urbanization and a growing population.

SNC-Lavalin's expertise in transportation systems and interest in sustainable development will greatly benefit the new assistant professor, who will work closely with the company on projects and research of mutual interest.

“We strongly believe in the benefits of working closely with and maintaining partnerships with industry, to ensure a strong transfer of knowledge from our research to market, and to ensure that our research and education programs are as relevant to current practices as possible,” said Department Head Reza Vaziri. “We are extremely pleased to have the partnership of SNC-Lavalin.”

“This new partnership with UBC's Department of Civil Engineering is part of our commitment to bridging the outstanding education and knowledge that UBC brings together with the transportation infrastructure implementation experience that SNC-Lavalin is known for locally and internationally,” says Stephan Mehr, Manager of Transportation Planning. “We believe that the inclusion of practical experience gained in implementing large projects, such as the Canada Line, will bring added value to the engineering student's experience, and we look forward to the interesting initiatives that will result from this new position.”

Applied Science extends its sincere appreciation to SNC-Lavalin for making this new position possible. ■

STUDENTS

Shell Canada renews Campus Ambassador Program at UBC

Shell Canada launched its Campus Ambassador Program (CAP) in 2006, in partnership with select universities across Canada, to bolster educational programs and student activities. In spring 2009, following the success of the first three years of the program, Shell Canada provided \$400,000 through the Shell Student Development Fund to renew CAP at the University of British Columbia. Shell Canada will continue its support of and involvement with students in Mining, Chemical, Geological, Mechanical and Civil Engineering. CAP has also been renewed for students in the Sauder School of Business and for Geophysics and Geological Sciences students in the Faculty of Science.

The program renewal will again give students a taste of real-world engineering through Shell's participation in various classroom and co-curricular activities. Over the next three academic years, Shell Canada's CAP contribution will support student field trips to the Shell Scotford facility, UBC's Geological

Engineering field school, and several student prizes and clubs. Shell will also have the opportunity to participate in undergraduate education within Applied Science through guest lectures and design-project assistance and feedback. Most importantly, the program connects students with engineering professionals working in the field, for networking and mentoring opportunities.

“Shell Canada's Campus Ambassador Program is a great asset to our students' learning experience,” says Dean Aboulnasr. “It provides an exceptional opportunity for students to learn from practicing engineers. This exposure to real-world applications is essential to students' understanding of what engineering is all about. We are proud to have the partnership of Shell Canada.”

“Over the past decade, Shell has invested more than \$15 million with post secondary institutions across the country,” said Lorraine Mitchelmore, President and Country Chair, Shell Canada. “Our goal is simple — to bring out the best in Canada's students today knowing they will become the leaders of tomorrow.”

Applied Science sincerely thanks Shell Canada and its Campus Ambassador Program for their continued support of students and educational programs at UBC. ■

UBC Engineering teams sweep National Business Plan Competition



Tagg Jefferson (left) and Lin Watt, co-founders of Dragonfly Instruments, won first place in the Enterprize Canada Business Plan Competition

Dragonfly Instruments, co-founded by UBC Engineering students Lin Watt (CHBE) and Tagg Jefferson (IGEN), won first place in the Enterprize Canada Business Plan Competition, held February 5-7, 2010, in Vancouver. The company's initial product is a portable field device that measures water quality with laboratory-grade accuracy, allowing environmental field technicians to get results in minutes, instead of days. Technicians will be able to modify where and how they sample on-site, producing better-quality results and significant savings in both cost and time.

In addition to Dragonfly Instruments, two other teams from UBC placed in the top three nationally.

Aegis, developed through the APSC 486/New Venture Design course, won second place. Aegis's main product is software that connects students, teachers and parents through an online portal containing grades, assignments and other information. Founders include engineering students Winnie Lai (ENPH), Edwin Jaury (EECE) and Christopher Chan

(CHBE) and commerce students Scott Schaffter and Peter Stein.

Aeos Biomedical — which also grew out of a New Venture Design course collaboration — won third place. Aeos is dedicated to improving patient care and reducing medical errors by increasing the amount of patient-specific information available to surgeons. Aeos's current device, Target Tape, contains semi-permanent ink and radiopaque materials in a ruler or grid pattern, aiding medical imaging by allowing a surgeon to correlate information from an X-ray based scan to the patient. The team includes engineering students Patricia Backlund (ENVE) and Colin O'Neill (IGEN) and commerce students Nicholas Seto, Wylie Spencer and Emi Yamada.

MNB Devices, founded by engineering student Graeham Douglas (MECH) and political-science student Andrei Pop, placed third in the Enterprize regional competition. The company produces the Cerv360, a powered head-support system for people with late-stage amyotrophic lateral sclerosis (ALS, or Lou Gehrig's disease). The Cerv360 allows for comfortable resting of the head and a return of neck function to people who experience extreme weakness and fatigue of the neck muscles because of the disease. No effective device providing this kind of support for people living with ALS currently exists. ▀

entrepreneurship@UBC: a new initiative to drive our future

Applied Science is proud to be one of the founding faculties of the new entrepreneurship@UBC initiative. Launched in fall 2009, the program is designed to provide educational opportunities, capital and mentorship for select UBC students or student teams with marketable ideas for entrepreneurial products, services or processes.

The program was created in partnership with the British Columbia Innovation Council, which promised matching funds for private donations up to \$400,000. Diane and Peter van der Gracht (BASC '77, MASC '82), Greg Peet (BCom '76), Paul Lee (BASC '87) and Geof Auchinleck (BASC '81) have pledged their financial support to the initiative.

UBC has an excellent record of commercialization of its research initiatives, and this initiative is intended to encourage students across all faculties to continue this tradition and to boost their own careers and Canada's economy through the development of new ideas.

At the heart of the initiative is the entrepreneurship@UBC Fund, which will provide select students with the opportunity to apply for pre-seed-capital financing to take their ideas from concept to investor readiness. The university is seeking donations to create a \$10 million capital fund; it is hoped that the fund will eventually recapitalize enough to be self-sustaining and foster generations of student entrepreneurs.

If you would like to contribute to this innovative initiative to boost students' entrepreneurial skills and support Canada's economic future, please contact Debbie Woo, Development and Alumni Relations, at 604-822-6856 or debbie.woo@ubc.ca ▀

The Engineering Student Centre

The Faculty of Applied Science, together with the Engineering Undergraduate Society (EUS), is working to gain approval and funding for a new Engineering Student Centre — a facility that will provide students with study, meeting, and social spaces. The building will bring together students from across engineering disciplines, allowing students to learn from each other and to form networks that will enhance their careers as well-rounded professional engineers.

The new centre will be a strong symbol for UBC's Engineering community and will provide a dedicated and welcoming home for engineering students and alumni alike.

We are inviting alumni to support this project. If you would like more information about the Engineering Student Centre or have ideas to share, please contact: Debbie Woo, Development and Alumni Relations at 604-822-6856 or debbie.woo@ubc.ca ▀

Dan Gelbart supports Mechanical Engineering

Dan Gelbart (LLD '09) — gifted entrepreneur, co-founder of Kardium Inc. and co-founder and former president of Creo Products — has been a long-time supporter of the Department of Mechanical Engineering. He has volunteered his time and expertise on the department's advisory council, lectured on technical design, and this year is teaching a graduate course about industrial sensors and actuators, for which he is freely giving his time and providing all equipment and material resources.

In addition to the time and expertise Gelbart has dedicated to our programs, he has also recently contributed \$80,000 to Mechanical Engineering for the purchase of a water-jet cutter for use in undergraduate teaching labs, as well as in graduate and faculty teaching research. The new equipment will enhance the department's leading-edge education, and engineering students will graduate with the skills, expertise and techniques needed in industry today.

Applied Science expresses its considerable appreciation to Mr. Gelbart for his tremendous support for UBC's Mechanical Engineering students. ▀

Marshall Bauder makes second contribution toward engineering economics education

In 2006, Marshall Bauder (BASC '48) made a generous gift of shares to Applied Science to support educational efforts in engineering economics. His long and varied career as an engineer helped him develop a keen sense of the importance of the economic impact that engineering designs, new technologies and their applications could have on society.

Over the past four years, Bauder's contribution has supported the development of several graduate-level courses in engineering economics and business and the addition of engineering economics courses to the undergraduate curriculum.

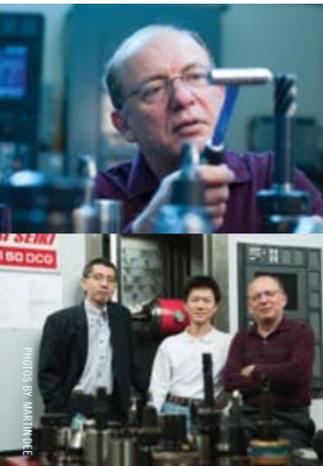
In addition, his contribution made it possible for Applied Science to conduct a survey across

departments and programs, analyzing various engineering courses to gauge and assess content in four areas: economics, business, management and entrepreneurship. Equipped with the data from the survey, Applied Science can now address any gaps identified and ensure that every student has the opportunity to gain skills and knowledge in these areas.

Recently, Bauder augmented his original contribution with a further gift of shares, enabling the faculty to continue pursuing improvements in the engineering economics curriculum. On behalf of the students of UBC Engineering, the faculty expresses its appreciation to Mr. Bauder for his leadership in pursuit of this important curriculum change and for his ongoing support. ▀

RESEARCH

Virtual machining network supports Canadian industry



From left: UBC Professors Ryozo Nagamune, Steve Feng and Principle Investigator Yusuf Altintas are part of the NSERC CANRIMT team.

The UBC-based NSERC Canadian Network for Research and Innovation in Machining Technology (CANRIMT) is developing the world's most advanced virtual machining technology that will benefit Canadian aerospace, automotive, power generation, mould-making and automation systems industries.

"The idea is to develop a virtual machining system so that before companies build and invest significant funds, machines can be modeled virtually, reducing the cost of trial and error to a minimum," says Primary Investigator Yusuf Altintas, Mechanical Engineering Professor and NSERC-Pratt & Whitney Chair in Virtual High-Performance Machining.

For example, a typical aircraft rib is machined at high speed from 500 kg slabs. The rib weighs about 15 to 20 kg after machining, and the average cost is about \$20,000. If the part is machined at low speeds, the cost increases. If it is machined at high speeds without scientific planning, the rib vibrates and damages both the part and the machine, and costs rapidly increase.

Over the past 24 years, UBC's Virtual Machining System researchers have developed scientific knowledge that identifies the most productive cutting speeds and conditions while maintaining part quality.

The science-based technology is used by more than 130 companies and research centers worldwide.

NSERC CANRIMT researchers will add more science-based methods to the Virtual Machining System, working to further reduce machining time and increase productivity.

Under Altintas's direction, the CANRIMT network will receive \$5 million from an NSERC Strategic Network Grant and \$400,000 from industry over five years. The network includes 20 researchers from seven universities in British Columbia, Alberta, New Brunswick, Ontario and Quebec. Approximately 100 engineers are expected to be trained through the network.

"Applied research seeks to improve our academic understanding of a subject while also creating applications that are immediately useful to society," says Don Brooks, UBC Associate Vice-President Research & International. "Not only does UBC's research in virtual machining have the highest academic citation record in its field, but it is also broadly used by industry across the globe."

In addition to Altintas, the CANRIMT research network includes UBC Mechanical Engineering Professors Steven Feng, NSERC-Pratt & Whitney Associate Chair in Virtual High-Performance Machining; Ryozo Nagamune; and Xiaodong Lu. It also includes researchers from McMaster University, École Polytechnique, Dalhousie University and the Universities of Toronto, Calgary and Windsor. ▀

An expert in mathematical modelling, Bowen collaborated extensively. His research recently focused on modelling of microvascular exchange in humans, hydrodynamics and mass transport in hollow-fibre bioreactors, acoustic-filter development, modelling of ex vivo gene transduction and heat transfer in circulating fluidized beds. Because of his incisive mind, Bowen has been described as being able to "unearth angles that other people have not," producing quality research that is still cited and known throughout the world today for its novelty and meticulousness.

Described by Department Head Peter Englezos as "a wonderful individual, both as a person and a researcher," Bowen devoted much of his time to teaching and has been regarded as one of the department's best and most dedicated by both students and faculty. Through his own work and his exacting expectations, Bowen taught graduate students to strive to achieve high standards, enriching and raising the quality of all the collaborative work he and his students have been involved in. ▀

FACULTY

After raising the bar for many, Professor Bowen retires

After 28 years of dedication to his research and students, Professor Bruce D. Bowen (BASC '67, PhD '78) has retired from Chemical and Biological Engineering. For many years to come, faculty and alumni will remember his many contributions, not the least of which will be his detailed and well-prepared course notes, which others are still gratefully using.

After graduating from UBC, he took an assistant professorship at Memorial University in Newfoundland. On the strength of his excellent modeling skills, particularly his work on natural convection heat transfer to melting icebergs, he joined the UBC Department of Chemical and Biological Engineering in 1982.

Colleague Professor John Grace says he has "never known anyone as thorough" as Bowen, "an absolute perfectionist."

FACULTY

Awards & Achievements

Applied Science Manager of the Centre for Instructional Support **Jim Sibley** received the Dean's Award for Excellence in Service.

Chemical and Biological Engineering Professor **James Feng** received a UBC Killam Faculty Research Fellowship.

Chemical and Biological Engineering Professor **John Grace** received the UBC Killam Award for Excellence in Mentoring.

Chemical and Biological Engineering Assistant Professor **Eric Lagally** received the UBC Undergraduate Research Opportunities Mentorship Award.

Chemical and Biological Engineering Professor Emeritus **Richard Kerekes** received the TAPPI Gunnar Nicholson Gold Medal Award.

Civil Engineering Assistant Professor **Eric Hall** was elected Fellow of the Canadian Academy of Engineering.

Civil Engineering Professor **Tarek Sayed** received the Sandford Fleming Award from the Canadian Society for Civil Engineering, as well as three Best Paper Awards at: the 2009 Annual Meeting of the Transportation Association of Canada; the 89th annual meeting of the Transportation Research Board; and the 2010 Canadian Association of Road Safety Professionals/Insurance Bureau of Canada meeting.

Electrical and Computer Engineering Associate Professor **Purang Abolmaesumi** was appointed an Early Career Scholar by the UBC Peter Wall Institute for Advanced Studies.

Electrical and Computer Engineering Associate Professor **Rafeef Abugharbieh** received a UBC Killam Faculty Research Fellowship.

Electrical and Computer Engineering Professor **Vijay Bhargava** received four honours. He received a UBC Killam Research Prize and the IEEE Outstanding Educator Award; he was appointed a Foreign Fellow of the Indian National Academy of Engineering; and he was named Most Cited Author by ISIHighlyCited.com.

Electrical and Computer Engineering Professor **Guy Dumont** received three honours: he received Second Place for his Scientific

Exhibit at the 2009 American Society of Anesthesiologists Conference; he was elected Fellow of the Canadian Academy of Engineering; and he was named Most Cited Author 2006-2009 by the Elsevier journal *Chemical Engineering Research and Design*.

Electrical and Computer Engineering Professor **Sid Fels** received the Best Presentation Award at the 17th International Association for Computing Machinery Conference on Multimedia.

Electrical and Computer Engineering Associate Professor **Lutz Lampe** received the UBC Charles A. McDowell Award for Excellence in Research.

Electrical and Computer Engineering Professor **José Martí** was elected Fellow of the Canadian Academy of Engineering.

Electrical and Computer Engineering Professor **Robert Schober** was elected Fellow of the IEEE.

Electrical and Computer Engineering Associate Professor **Z. Jane Wang** received a UBC Killam Faculty Research Fellowship.

Materials Engineering Professor **David Dixon** received the Sherritt Hydrometallurgy Award from the Hydrometallurgy Section of the Metallurgical Society of the Canadian Institute of Mining, Metallurgy and Petroleum.

Materials Engineering Associate Professor **Göran Fernlund** received a UBC Killam Teaching Prize.

Materials Engineering Professor **Anoush Poursartip** was elected Fellow of the Canadian Academy of Engineering.

Mechanical Engineering Professor **Yusuf Altintas** received an Honorary Degree from the University of Stuttgart and was named Fellow of the School of Engineering at the University of Tokyo.

Mechanical Engineering Professor **Elizabeth Croft** has been elected Fellow of the American Society of Mechanical Engineering.

Mechanical Engineering Professor **Clarence de Silva** received the Technical Award of the Proceedings of the Digital Signal Processing Creative Design Contest.

Mechanical Engineering Department Head **Sheldon Green** was elected Fellow of the Canadian Academy of Engineering.

Mechanical Engineering Professor **Carl Ollivier-Gooch** received the Shahyer Pirzadeh Memorial Award from the American Institute of Aeronautics and Astronautics.

Mechanical Engineering Senior Instructor **Pete Ostafichuk** received a UBC Killam Teaching Prize.

Mechanical Engineering Advising, Recruitment and Senior Program Assistant **Jennifer Pelletier** was named Honorary President of the EUS.

Mining Engineering Professor Emeritus **Janusz Laskowski** received the Medalla Rectoral and has been named Distinguished University Visitor, from the Universidad de Concepción (Chile).

UBC School of Engineering Instructor **Yang Cao** received the school's Pioneer's Award for Teaching Excellence.

UBC School of Engineering Assistant Professor **Kenneth Chau** made the UBC Okanagan campus' Teaching Honour Roll.

UBC School of Engineering Assistant Professor **Jonathan Holzman** received the school's Grad Gala Teaching Excellence Award.

UBC School of Engineering Assistant Professor **Mina Hoorfar** made the UBC Okanagan campus' Teaching Honour Roll.

UBC School of Engineering Assistant Professor **Homayoun Najjaran** received the school's Grad Gala Teaching Excellence Award.

UBC School of Engineering Assistant Professor **Ahmad Rteil** received the school's Grad Gala Teaching Excellence Award.

In Memoriam

This past year the faculty was deeply saddened by the loss of revered individuals. Each contributed greatly — to his field of engineering and to society — and will be missed.



FACULTY

Professor Chad Bennington (1957-2010)

UBC Chemical and Biological Engineering Professor Chad Bennington passed away suddenly on February 14, 2010, at age 53. An expert in paper pulping technology, he taught core courses on the topic and served as the associate coordinator of the Pulp and Paper Master of Engineering Program from 1988 to 1999.

Bennington was born January 9, 1957, in St. Boniface, Manitoba, and attended grade school in North Vancouver. He obtained his BSc in Chemistry from UBC in 1979.

After graduation, he worked as a process engineer/chemist at MacMillan Bloedel's Powell River Mill. In 1981 he returned to UBC to pursue postgraduate studies in the Department of Chemical Engineering, completing his MSc in 1983 and his PhD in 1988.

In 1988 he joined Paprican (now FPIInnovations) as a senior research engineer in the UBC Pulp and Paper

Centre. He was also appointed an adjunct professor in the Department of Chemical and Biological Engineering. In March 2002 Bennington was awarded an NSERC/Paprican Industrial Research Chair in Chemical Pulping Technology and in 2006 was appointed professor in the Department of Chemical and Biological Engineering.

Bennington was a leading expert in mixing processes in the pulp and paper industry and other chemical process industries. His research was recognized by academia and industry around the world. He established a world-class research group of students and postdoctoral fellows and had numerous collaborations with faculty and industry.

"Chad was extraordinarily dedicated to excellence, which showed through his commitment to his students, his passion about the pulp and paper industry, and his confidence that this sector has so much to offer to our province and the country. Chad fully dedicated his talents to improving the future," says Chemical and Biological Engineering Department Head Peter Englezos.

A colleague from the University of Alberta expressed her thoughts: "His technical work had a depth that I think few of us really appreciated because he was so unassuming. Next to his normally easygoing nature, his passionate commitment to the pulp and paper industry was startling in its intensity, and his willingness to ponder our work and ask thoughtful questions several months later made him stand out as a really exceptional scholar."

Bennington loved the outdoors and enjoyed hiking, kayaking, scuba diving, swimming and fishing and shared his passion with his many friends and students. He was an excellent photographer and appreciated art, music and literature. He brought joy to staff by coming into the office to say, "I'm just looking for smiles."

Bennington is survived by his wife and two daughters. His untimely passing is a devastating loss for all whose lives he touched, including colleagues, students and the academic community to which he made so many contributions. ■



FACULTY

Professor Kenneth Pinder (1929-2009)

UBC Chemical and Biological Engineering Professor Emeritus Kenneth Pinder passed away November 30, 2009. A faculty member since 1963, and active in the department until shortly before his death, he was a friend to many and will be greatly missed.

He served in many roles, including department head (1987-1992) and as the founding coordinator of the Master of Engineering Program in Pulp and Paper Engineering. As a leader, he was decisive and efficient, keeping the department on course through a series of lean years and helping to build the Biotechnology Laboratory (later to become the Michael Smith Laboratories in 2004).

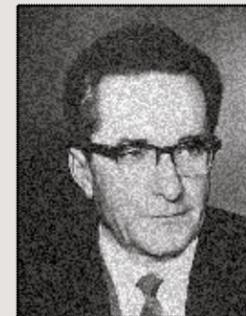
Pinder was a dedicated teacher, in particular in Process Control and in Chemical Reaction Engineering. In the former, he was especially adept in maintaining an analogue controller and using it to illustrate concepts

well after most universities had switched to solely digital control. For many years he taught both the undergraduate and graduate process-control courses. In Chemical Reaction Engineering, he established a series of unique laboratory experiments to illustrate such concepts as residence time distributions, gas-liquid reactions and kinetic measurements.

In research, Pinder was rare in having broad interests at a time of increasing specialization. He published in a number of fields — pulp processing, energy storage, direct-contact heat transfer, rheology, drying, solubility and phase diagrams, process control, gas hydrates, solar energy, water-pollution control and biomedical engineering. He continued his research well beyond his official retirement, working with a variety of graduate students, postdoctoral fellows and visiting scholars. One such collaboration with a UBC Nursing researcher recently resulted in a pelvic-floor training device to help people with urinary incontinence.

"Ken's inspirational leadership and care for humanity has influenced and touched many, including me," says Department Head Peter Englezos. ■

FACULTY



Professor Jan Leja (1918-2009)

On November 4, 2009, UBC Mining Professor Emeritus Jan Leja passed away. Known worldwide for his contributions, Leja left a significant legacy through his studies of the surface chemistry of flotation, not only in the body of scientists he trained but also in the literature. His book *Surface Chemistry of Froth Flotation*, which has run to two editions since it was first published in 1982, has been the most influential textbook in the field.

Leja was born in Poland in 1918 and first started studying metallurgical engineering at the Academy of Mining and Metallurgy in Krakow. Incarcerated in prisons and concentration camps in Siberia from 1939 until 1942 during World War II, Leja proved to be a remarkable survivor and was finally able to complete his studies in 1945, when he was granted both his associate's (ARSM) and bachelor's (BSc) degrees with first-class honours from the Royal School of Mines in England. In 1947, he was awarded an

engineering diploma from the University of Krakow and was granted a PhD in 1954 for his highly original work "Molecular Interactions at Interfaces, as Applied to Flotation Phenomena."

Leja became Professor of Mineral Process Engineering at UBC in 1965 and served admirably in that position until his retirement in 1983. One of the areas in which he acquired a broad interest was focused on the use of infrared spectroscopy in studying adsorption of collectors onto sulfide minerals. His joint publications on this topic with Professors L.H. Little and George Poling are still being quoted 50 years later.

Leja won several awards for his teaching and research in mineral process engineering, including the Canadian Institute of Mining and Metallurgy ALCAN Award; a Doctor of Honorarius Causa degree from the Marie Curie-Sklodowska University in Lublin, Poland; and UBC's Walter Gage Teaching Award. He authored over 60 technical papers and registered four patents on mineral processing. ■

ALUMNI



An Engineer and a Gentleman: C. Peter Jones (1918-2009)

Respected greatly throughout the architectural and engineering communities, UBC alumnus Peter Jones (BA '47, BAsC Civil '48) P.Eng., died peacefully at home in North Vancouver on September 30, 2009.

"He was a man of infinite integrity and was often put in situations where he would exercise good judgment based on reasonableness and fairness. Whatever the situation, he held the trust of everyone around him," says Steve Taylor (BAsC '63), P.Eng., one of the many structural engineers who benefited greatly from Peter's mentorship.

Born in England, Peter moved to Canada as a child so that his father, Cyril (BAsC '24), could attend UBC to study engineering. The younger Jones was accepted into the first class at Royal Roads in 1941 and soon after joined the Royal Canadian Navy, where he saw active duty as a gunnery officer during World War II.

After the war, Jones and his wife, Eleanor, moved to Vancouver, where he resumed civil engineering studies at UBC, graduating with honours at the top of his class in 1948. With experience as an architectural assistant, he completed the Architectural Institute of British Columbia (AIBC) Intermediate standard.

In 1952, Jones was a founding partner of Read Jones Christoffersen (RJC) Consulting Engineers, where he worked for 25 years as a senior partner and vice-president responsible for a wide range of structural engineering projects.

For all his adult life, Jones gave countless hours of his time, serving as school trustee in North Vancouver, and as alderman and mayor of West Vancouver.

Upon completing his second term as mayor in 1978, Jones partnered with two former colleagues from RJC to form Jones Kwong Kishi Consulting Engineers. Both this firm and RJC remain vibrant contributors to the world of structural engineering.

"Peter inspired all those around him to attain their fullest potential. He was fair and modest and never took advantage of anyone," says W. Hou Kwong, P.Eng., who knew him over the course of 45 years as business partner and friend.

"After dealing with a particularly challenging client, I remember telling Peter emphatically that I did not want to work with that client again. Peter then said

to me, 'If that's how you feel, Hou, sooner or later you'll have no one you can work with,'" says Kwong. "That really changed my thinking about working with people and benefited my career in later years. Peter was a man of absolute wisdom. You may not have been aware of it when you were around him all the time; like the sunshine upon us, we may not be aware of its abundance until we're short of it."

One example of Jones' shining integrity was evident after a Burnaby, B.C., supermarket roof collapsed in 1990, and he was approached by the opposing parties to be an expert witness in the dispute.

"Peter chose to be the expert advisor for the commission in the inquiry because he felt he could best serve society in that role," says Kwong.

In addition to his engineering work, Jones taught Architectural Structures in UBC's School of Architecture in the 1970s, and the Architectural Institute of BC recognized him in 1998 as an Honorary Member for his substantial contributions to architecture.

During 1998 he served as president of The Association of Professional Engineers and Geoscientists of British Columbia (APEGBC), and in June 2008 the association honoured him as an inaugural Engineers Canada Fellow in recognition of his significant contributions to the advancement of the profession of engineering.

"Peter had a good intuitive sense for engineering and had a terrifically human character," says Jim Mutrie (BAsC '66), P.Eng., who worked with Peter for many years. "He was great at guiding us all, especially those new out of school. He was a good teacher and an amazing consensus builder."

Jones was the inspiration behind the founding of Capilano College in 1968 and became its first board chair. Upon receiving university status, Capilano University bestowed its first honorary degree on him in the fall of 2008.

According to son-in-law, Dr. George Pedersen—former president of UBC, Simon Fraser University and the University of Western Ontario—he was passionate about sharing his knowledge. "In my long career as an educator, I have never met another person with greater intellect and ability than Peter."

In 1990, Jones began volunteering for the Palliative Care Unit at Lions Gate Hospital and is remembered with fondness for his thoughtful and caring approach to patients.

Peter Jones is lovingly remembered as a gentleman and a gentle man. ■

Alumni Updates

Welcome, new alumni! This year marked the addition of more than 800 new UBC Engineering alumni, and a special welcome goes out to the inaugural graduates of the School of Engineering.



A Message from the Director of Development and Alumni Relations

We've seen incredible alumni involvement over the past year, and we hope that the coming years will see even more of you returning to campus and becoming involved. This May we welcomed back several hundred alumni to campus for Alumni Weekend, and I am pleased to say that it was our most successful alumni reunion weekend to date.

The weekend kicked off with our inaugural UBC Engineering Excellence Celebration—a fun-filled evening celebrating the successes of our students and alumni. More than 200 alumni, students, faculty and staff of UBC Engineering gathered at the Four Seasons Hotel Vancouver, and Dean Aboulnasr proudly presented inaugural UBC Engineering Alumni Awards to four of our distinguished alumni. If you were unable to join us this year, we hope you will be able to attend next year's celebration!

In this issue of *Ingenuity*, we highlight a few of our latest engineering-related initiatives, including plans for a new Engineering Student Centre and the launch of an exciting new initiative—entrepreneurship@UBC. We are also pleased to share a few stories highlighting recent UBC Engineering support from various members of the engineering community.

For more information on the many different ways to get involved with UBC Engineering, please contact us at 604-822-8335 or visit us online at www.apsc.ubc.ca. Also, if you know of an engineering alumnus who isn't currently connected with Applied Science, please connect them to us—there is a lot happening in Engineering at UBC, and we want to be sure you all know about it.

We look forward to hearing from you!

Andrea Wink, BA (Hon.), CFRE

Director,
Development and Alumni Relations
Faculty of Applied Science

Alumni Notes

Partha Pratim Pande (PhD '05) received a prestigious National Science Foundation CAREER award to design a tiny and sophisticated wireless communications system—all on an integrated circuit that measures only about 20 millimeters on each side. Pande is an assistant professor in the School of Electrical Engineering and Computer Science at Washington State University and plans to develop a wireless network on a multicore computer chip with his research group and the five-year, \$450,000 award.

Going green...

The Faculty of Applied Science and UBC Engineering are dedicated to going green and becoming more sustainable in our practices.

If you would like to receive *Ingenuity* electronically rather than in print, please visit:
www.engineering.ubc.ca/goinggreen



Engineering | ALUMNI

Event Highlights

GEOLOGICAL ENGINEERING ALUMNI AND INDUSTRY DINNER

JANUARY 23, 2010

Geological Engineering celebrated its eighth annual alumni and industry dinner at the UBC Golf Club. Calling all Geological Engineering alumni — please ensure that we have your e-mail address so we can invite you next year.

ENERGY, SUSTAINABILITY AND THE CITY — NEW YORK

JANUARY 28, 2010

Applied Science hosted a panel of UBC, Columbia and Princeton faculty members to discuss our energy future, the impact of energy costs on the economy and what we need to do now to plan for the future.

ANNUAL MINING DINNER

JANUARY 30, 2010

The Norman B. Keevil Institute of Mining hosted its 14th Annual Mining Dinner at the Four Seasons Hotel Vancouver for alumni, industry friends and students. John Swainson (MINE '77), gave an inspiring talk about his career experiences in mining and software.

OLD RED NEW RED

FEBRUARY 4, 2010

Applied Science Alumni Relations and the EUS co-hosted the annual event bringing students and alumni together to celebrate traditions. As Engineering Week came to a close and the Vancouver 2010 Olympic Games were pending, we celebrated the spirit of competition with a showcase of the UBC Engineering Own the Podium research.

CLASS OF 1950 60TH ANNIVERSARY REUNION LUNCHEON

MAY 27, 2010

The largest post-war graduating class, BAsc '50 came out in force to the UBC-wide Class of 1950 60th Anniversary Reunion Luncheon. The Engineering class of '50 was by far the largest of all cohorts attending and even had to play musical chairs to make space for the dean.

MECH 1950 REUNION

MAY 28, 2010

Mechanical Engineering Class of 1950 celebrated its 60th anniversary over Alumni Weekend. Department Head Sheldon Green led a tour. Of particular interest was the large class photo in the hallway; with 132 members, it is the

largest graduation class to date. Green joined alumni for a luncheon and was entertained with reminiscences of class exploits, including the building of the Square-Wheeled Locomotive. *SUBMITTED BY GEORGE PLANT, (MECH '50)*

UBC ENGINEERING AT ALUMNI WEEKEND

MAY 28-30, 2010

UBC Engineering welcomed over 100 alumni, friends and prospective students to campus during Alumni Weekend 2010! The classes of 1950, 1960, 1970, 1980, 1985, 1990 and 2000 celebrated anniversaries at our annual Engineering Reunion Reception.

Future engineers enjoyed campus tours, attending information sessions and a BBQ organized by the EUS.

Events included a showcase of work from young alumni. Recent students presented how UBC Engineers are making a difference! Highlights included: the iGEM (the International Genetically Engineered Machines) team that won a gold medal at MIT's biosensor technology competition; the UBC Electric Car Club, which presented its transformed 1972 Volkswagen Beetle — now an electric-powered car; and Energy Aware, a UBC spinoff led entirely by alumni, which creates energy-monitoring displays that track electricity consumption in real time.



EE 1950 REUNION

MAY 29, 2010

Electrical Engineering Class of 1950 celebrated its anniversary at Alumni Weekend by joining in the UBC 60th Anniversary Reunion Luncheon and UBC Engineering activities. Mark Bradwell, Edward Hird, Jack Froud, Fred Mullen, Roy Ruddell and Dick Abrahamson represented the original 102 members and enjoyed catching up and meeting Dean Aboulnasr and ECE Department Head Andre Ivanov.

MECH 1960 REUNION BREAKFAST

MAY 30, 2010

Harold Copping organized a breakfast for the alumni from MECH '60 at the ABC restaurant. Some had not seen classmates for 50 years! Each of us took a short turn to relate where we had been and where we worked. We're going to follow up via email with a one-page blurb to each other, and we're going to get together next year. *SUBMITTED BY WALTER KILIK (MECH '60)*



GRADUATION

JUNE 1, 2010

Congratulations to the graduating class of 2010, and welcome to the alumni community! This year, over 800 Engineering students were conferred their respective degrees and joined the more than 22,000 engineers who call UBC their alma mater. UBC Engineering alumni have been influencing society since the first graduating class, and it is an honour and pleasure to welcome the men and women who are joining these ranks.

Thank you for everything you have contributed to UBC and continue to contribute to the world as a UBC graduate. Please know that we hope to hear about your professional and personal achievements as a member of our alumni community. Please stay in touch!

Contact: Tracey Charette 604-822-9454 or email tracey.charette@ubc.ca



Engineering Alumni Recognized

Building on decades of making a difference

Celebrating the successes of our students and alumni, Dean Tyseer Aboulnasr hosted the inaugural UBC Engineering Excellence Celebration, Making a World of Difference, on May 28, 2010. More than 200 alumni, students, faculty, staff and guests celebrated the many contributions of our people.

"It is simply amazing to consider all that we engineers have added to society. We develop solutions for real problems. It is an honour and a pleasure to celebrate UBC Engineers and all their contributions," said Dean Aboulnasr in presenting the first annual UBC Engineering Alumni Awards.

Dr. John S. MacDonald (BAsc '59, DSc '89) received the UBC Engineering Lifetime Achievement Award. Currently Chairman, CEO and Co-Founder of solar-energy company Day4 Energy Inc., MacDonald's distinguished career includes serving on the boards of numerous technology companies; advising Canadian and international governments on science, technology, trade policy and industrial policy; and

co-founding MacDonald Dettwiler and Associates, Canada's principal space company.

"John was recognized 20 years ago with the Order of Canada; it is due time we recognize him," said Aboulnasr. "Through his many contributions, he has enabled thousands of jobs, providing meaningful work and transforming the lives of countless people."

Dr. Ken Spencer (BAsc '67, PhD '72) received the UBC Engineering Community Service Award in recognition of his extraordinary commitment to the betterment of society. Retired CEO and co-founder of Creo Products, Spencer works with many charities.

Upon accepting his award, Spencer recalled one of the most touching moments of his philanthropic career, when a beneficiary of The Cleaning Solution — a socially progressive company that hires people with mental-health disabilities — said to him, "I used to be a nobody, and now I am a somebody." Spencer continued, "I've been honoured many times with business and engineering awards, but this is first time I've been recognized for my second career — working with nonprofits. Thank you."

Lauren Kulokas (BAsc '06) received the UBC Engineering Outstanding Young Alumnus Award. As Vice President and Co-founder of Energy Aware, a company formed through UBC's New Venture Design course, Kulokas develops products to promote sustainability.

Student Jackie Nichols received the UBC Outstanding Future Alumnus Award. Nichols moved to Kelowna in 2005 to pursue a degree in electrical engineering at the newly

From left: MC for the evening Bill Richardson (BAsc '83); Materials Head Warren Poole; Dean Tyseer Aboulnasr; Jackie Nichols; Dr. Ken Spencer; Lauren Kulokas; guest speaker and former B.C. Premier and Vancouver Mayor Mike Harcourt; Mechanical Head Sheldon Green; Civil Head Reza Vaziri; Electrical and Computer Head Andre Ivanov; Associate Dean Robert Hall; Mining Head Bern Klein.



Mining Engineering Associate Professor Marcello Veiga ended the evening with environmentally-friendly parodies of popular songs.



Tom Curran (MECH student), Lin Watt (2009-10 EUS President, CHBE student) and Jay Drew (BAsc '77).

opened UBC Okanagan campus. She helped establish the Engineering Undergraduate Society and served on the executive for three years, organizing charity and professional events such as the first career fair on campus. She helped establish the UBC Okanagan IEEE Student Branch and a chapter of Alpha Omega Epsilon, the international engineering sorority. Nichols plans to pursue her Master's of Applied Science after graduating.

To view more photos of the event, visit www.engineering.ubc.ca/excellence2010

UBC ENGINEERING ALUMNI AWARDS

UBC Engineering proudly celebrates the achievements of our alumni and future alumni! After the success of our inaugural Engineering Excellence Celebration, we plan to host this event each year. Please consider nominating classmates, colleagues and industry partners for these awards. For nomination details, visit www.engineering.ubc.ca/alumni/awards.

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 ALUMNI EVENTS

CHML 1960 REUNION

AUGUST 24, 2010

Chemical Engineering Class of 1960 is celebrating its 50th reunion. Contact Ross Craigie at brccanuck@msn.com

CIVL 1949 REUNION

SEPTEMBER 15, 2010

Civil Engineering Class of 1949 is gearing up for their annual luncheon in Nanaimo, B.C.

MECH 1970

SEPTEMBER 14-16, 2010

Mechanical Engineering Class of 1970 is celebrating their 40th anniversary on Vancouver Island. Anyone interested in joining, please get in touch, as several graduates outside of MECH plan to attend. Contact Bryon Hodges at bryonhodges@hotmail.com

HOMECOMING

SEPTEMBER 18, 2010

Every September, thousands of UBC students, alumni and friends fill Thunderbird Stadium for our annual Homecoming celebration. After tailgating, they move into the stadium to cheer the Thunderbirds football team. Show your UBC spirit — body painting and noise making are encouraged — and join us at Homecoming.

UBC ALUMNI ACHIEVEMENT AWARDS

NOVEMBER 29, 2010

UBC will proudly recognize eight distinguished and celebrated individuals at its 16th annual UBC Alumni Achievement Awards — we hope to see you there.

GEOLOGICAL ENGINEERING ALUMNI DINNER

FEBRUARY, 2011

The annual dinner for students and alumni of the Geological Engineering program will be held this winter in February. For more information, visit www.geoeng.ubc.ca

UPCOMING EVENTS

UBC ENGINEERING PHYSICS ROBOTS AT SCIENCE WORLD

SEPTEMBER 18-19, 2010

Robo Racers, built by second-year UBC Engineering Physics students this summer, will be providing thrills and spills as they race to the finish at Science World.

CERC SEMINAR SERIES

SEPTEMBER TO MARCH 2010

CERC seminars highlight different aspects of energy, on both the supply and demand sides, and are held monthly from September to March. Visit www.cerc.ubc.ca for more information.

MECHANICAL ENGINEERING CELEBRATION OF ACHIEVEMENTS

OCTOBER 19, 2010, 6:30 - 8:30 PM

The Mechanical Engineering Celebration of Achievements honours exceptional students, faculty and staff. Interested alumni and friends of the department are invited to join us — visit www.mech.ubc.ca

ENGINEERING HOSTS TEACHERS' PRO-D DAY

OCTOBER 22, 2010

Each year, UBC Engineering hosts a professional development opportunity for teachers in the Lower Mainland. This year, high school teachers are invited for a day of activities, demonstrations and tours to enhance learning about and teaching science. www.engineering.ubc.ca/connects

A GREEN AND SUSTAINABLE SOLUTION TO GLOBAL PHOSPHOROUS DEPLETION

NOVEMBER 17, 2010

Professor Don Mavinic presents how a team of UBC environmental engineers has developed a sustainable and effective solution with worldwide applications. For details visit: www.civil.ubc.ca

ENGINEERING OPEN HOUSE

NOVEMBER 27, 2010

Save the date! Find out more about becoming a UBC Engineer today and how engineers make a world of difference. Bring your friends and family to explore the exciting options offered by UBC Engineering. www.engineering.ubc.ca/connects

GEOLOGICAL ENGINEERING DISTINGUISHED LECTURER

JANUARY 2011

Join us for a keynote lecture from a distinguished geological engineer. For more information, visit www.geoeng.ubc.ca



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