



THE
UNIVERSITY OF
BRITISH
COLUMBIA

ingenuity

Faculty of Applied Science
Engineering News

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When green is gold

Market and environmental costs make bio-fuels more appealing

With the recent alarming rise in the cost of gasoline, alternative fuels are becoming more and more appealing to consumers. Biodiesel is one such attractive alternative. According to a CBC News report in March announcing the first retail sale of biodiesel in Canada, it is comparable in price to a litre of gasoline and also has significant environmental benefits. Assistant Professor Naoko Ellis in the Department of Chemical and Biological Engineering is active researching the environmental benefits of using biodiesel instead of fossil diesel. According to her, the environmental benefits are enormous.

Biodiesel is a clean burning fuel produced from various renewable agricultural products—soybeans, canola, animal fats and recycled cooking oils. It can be burned in any standard, unmodified diesel engine in either pure form or, depending on temperatures, with a blend of petroleum diesel. Pure biodiesel is fully biodegradable, non-toxic to plants, animals and humans, and free of sulphur and carcinogenic benzene.

Making the world a better place is Ellis' primary drive in developing economical biofuels. Used vegetable oil, gathered from local french fries, is the raw material of her biodiesel research. She employs the alkali-catalyzed transesterification process to convert campus waste cooking oil into biodiesel. The oil is first subject to a pre-treatment process, removing particulates and water. The process then involves a chemical reaction of the oil with methanol that produces glycerol and methyl ester, called biodiesel when intended for use as fuel.

Biodiesel is an environmentally sustainable solution. Compared to petroleum diesel, biodiesel emits 80% less hydrocarbons, 48% less carbon monoxide and 50% less particulate matter. Its higher oxygen content allows for a more complete fuel combustion and added lubricity to engines, increasing fuel efficiency.

Because biodiesel is produced from renewable agricultural sources, which absorb atmospheric carbon dioxide (CO₂) through photosynthesis, the release of this gas during its combustion does not contribute to net CO₂ emission, making it carbon-neutral. The use of biodiesel will significantly reduce greenhouse gas emissions and contribute to Canada's commitment to meet the goals of the Kyoto Accord.

As part of her biodiesel research, Ellis is the primary investigator on the UBC Biodiesel Project. In partnership with the Environmental Youth Alliance, the project aims to produce a diesel fuel alternative from campus waste cooking oil to power UBC's maintenance vehicles. Using biodiesel will help the fleet reduce its greenhouse emissions by 78%. "Based on a lifecycle comparison of emissions at full facility capacity, the Biodiesel Project will clear the air of over one tonne of greenhouse gases every week," said Ellis.



Professor Naoko Ellis works with bio-oil (left) and biodiesel.

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Message

from the Dean



Welcome to the fall 2004 issue of *Ingenuity*. You will have noticed that, in each of the past issues, we have highlighted one or other of the Faculty's department heads or program directors. These individuals play an important role, not only in leading the department or program for which they are responsible, but also in contributing significantly to the overall leadership of the Faculty. Another group of individuals contributing to the Faculty's leadership includes our three associate deans; and in this issue, we are pleased to extend our regular "leadership" feature to them. The associate deans play a crucial role in the advancement of the Faculty in many ways, including the administration of our programs in areas such as student admissions, advancement and graduation, curriculum development, the development of research initiatives, and the acquisition and management of the Faculty's resources, including its budget, facilities and capital projects. In this issue, we are pleased to highlight on page 3 the role of Associate Dean Perry Adebar. I am sure that you will find this article, and indeed the rest of this issue, to be of interest.

You may be aware of a major development in the history of The University of British Columbia that was announced last spring—the creation of the new University of British Columbia campus, UBC Okanagan. The new UBC campus will open its doors in September 2005 on what is now the North Kelowna campus of Okanagan University College (OUC). This envisages an increase from 2,900 student spaces at present at OUC, to 3,800 when the campus opens to 7,500 students, including 500 graduate students, by 2009.

Engineering will also be present at Kelowna, and we anticipate that our Faculty will bring very positive impacts to the new campus. Planning is underway to develop distinctive, linked engineering programs at UBC Okanagan, with close ties to UBC Vancouver, including complementary programs and student transfers, but with a unique small-campus environment. We hope to introduce a new first-year program, Engineering One, in September 2005. This will be a small, distinctive program that follows the curriculum of first-year engineering at Vancouver, but with a strong focus on integrated learning and small class sizes. In future issues of *Ingenuity*, we hope to share with you further news on the development of engineering at UBC Okanagan. In the meantime, we are confident that this initiative will be a major step forward for our Faculty and for British Columbia.

We continually strive to enhance the quality of the education experience of our B.A.Sc. students in many ways, and in past issues we have reported on a variety of program developments and other initiatives intended to move towards this end. One aspect of our activities is the need to assess how well we do. This enables us to learn from our graduates and ensure the continual improvement of our programs and our learning environment. With this in mind, Business Analyst Yassaman Bayani in our Faculty recently analyzed a number of available surveys of our graduates. The results fall into three categories: program satisfaction, the employment environment, and financial impacts. While it is difficult to do justice to these results in this brief message, the overall findings are very positive. In the most recent survey, program satisfaction, including satisfaction with the usefulness of knowledge, skills and abilities acquired, and satisfaction with the quality of instruction, is very high at close to 90%; about 80% are employed in positions related to their program; and employment income is significantly higher than the average for graduates of other baccalaureate programs. One feature that stands out is the cyclical nature of the employment environment across the engineering disciplines. This is not necessarily correlated with student demand. This points to the need to balance shifts in program availability to reflect student demand, against the need to ensure stability in program size. We hope to continue to assess the views of our graduates, as well as employers, but in the meantime are most grateful to Yassaman for her contribution to this project.

As always, please contact me—by letter, telephone (604) 822-6412, fax (604) 822-7006, or e-mail dean@apsc.ubc.ca—if you are able to assist in the development of the Faculty, if you have any suggestions to provide, or if you would like further information on the Faculty's activities.

A handwritten signature in black ink that reads "Michael Isaacson". The signature is written in a cursive, slightly slanted style.

Michael Isaacson

Dean

To view past issues of *Ingenuity* and learn more about the Faculty, visit our website at <http://www.apsc.ubc.ca/publications/engineering.html>.

Balancing a multitude of responsibilities

All in a day's work for Associate Dean

If variety is the spice of life, then Associate Dean Perry Adebar has one of the spiciest jobs in the Faculty. First appointed as Associate Dean in July 1999, he is currently in the midst of his second term as Associate Dean Administration. Shadow him on any given day and you may observe him chairing a Faculty Curriculum Committee meeting, preparing for an accreditation visit, strategizing with Dean Isaacson, teaching a course in civil engineering and conducting research on the seismic design of concrete structures.

"I really enjoy the diversity I encounter as Associate Dean," said Adebar. "It's interesting to network outside my specific engineering discipline and encounter perspectives from other engineering departments, the Schools of Architecture and Nursing, and the various faculties across campus. The variety of people that I encounter is the number one benefit to being in administration."

As Associate Dean, Adebar's primary responsibilities focus on budget, resource, curriculum and accreditation issues; but the catch-all of the job description is "special projects." These special assignments can vary from attending a meeting in the Dean's absence to large-scale comprehensive tasks that take years to complete.

Of all his responsibilities, Adebar finds the job of representing the Dean the most insightful. "It's amazing to get a glimpse of the variety of things that cross the Dean's desk on any given day, from mundane paperwork to important issues that require you to drop everything else you are doing for the rest of the day," said Adebar.

What skills help Adebar meet the challenges he faces as Associate Dean?

According to him, all engineers have the potential to be good administrators, because engineering is all about solving problems. "Like all engineers, I enjoy looking at a complex problem, whether it be a high-rise building project or curriculum redesign, and coming up with a simple solution that is an acceptable compromise among all the stakeholders...that's the really fun part."

Being an engineer is no small part of Adebar's make-up. He received his Ph.D. from the University of Toronto in 1990 and, in the same year, joined UBC's Department of Civil Engineering.

As a scholar, he has made significant contributions towards addressing important issues facing the structural engineering profession. The main goal of his research has been to simplify the design of complex structural systems

by providing the practicing engineer with simple models that can readily be applied in industry. Both Canadian and U.S. codes of practice have been revised using the results of his research. As well, he has acted as a consultant for a number of complex and unique structures. In recognition of his scholarly achievements, he was recently honoured by the Association of Professional Engineers and Geoscientists of B.C. with the 2004 Meritorious Achievement Award.

As an educator, Adebar takes his responsibilities very seriously. He has a reputation as a no-nonsense teacher in the classroom, and at the same time, is appreciated for his mentorship—the inscription on his 2004 Best Fourth-Year Instructor award reads, "in recognition of...valuable instruction and extraordinary concern for the civil undergraduate students throughout the 2003-04 academic year."

As if all that were not enough, Adebar also chairs the UBC Senate Budget Committee and participates on a number of other UBC and Faculty committees, requiring strong leadership and teamwork skills. Most recently, he has added to his ever-growing list of responsibilities Chair of the Task Force to develop a business plan for the establishment of engineering



Dr. Perry Adebar, Professor of Civil Engineering and Associate Dean Administration.

at UBC Okanagan, and Co-director of the new Engineering One program at UBC Okanagan. The latter will involve faculty and staff recruitment, curriculum development, class scheduling, and so on. "I'm excited to have been appointed to these positions," said Adebar, "with a program start date of September 2005, we have significant challenges ahead of us."

According to Dean Isaacson, Perry Adebar has just the right blend of technical and interpersonal skills necessary to be effective in his job. "Perry has the intelligence to comprehend a complex problem and develop a viable solution," said Dean Isaacson. "He also has the listening and communication skills to work easily with a variety of individuals and, perhaps most importantly, a strong desire to better the Faculty of Applied Science."

Applied Science's bright young stars

Sisters get an early start on their post-secondary education

Ana Pop and her sister Cristina recognize a good challenge when they see it. Ana at 16 and Cristina at 15 are both currently enrolled in UBC's Electrical and Computer Engineering program. Both participated in the UBC Transition Program for academically exceptional students to help them transition from high school to university at an early age. Ana recalls learning about electric circuits during one transition course. She found this so fascinating that she replicated the experiment at home to investigate further.

Cristina chose engineering for its applied aspects as well. "Not only do I want to understand how the world works, but also how to use science to solve problems." Both credit their parents with encouraging them to pursue their interests. Applied science may well be in the Pop genes—mom is an architect and dad is a software engineer.

"From an early age, I've taken on challenges. Learning English in Grade 2 was the greatest challenge for me," said Cristina, who emigrated from Romania with her family in 1995. "Every year I've taken on new challenges because I love challenging myself."

Although academic success is the top priority for the Pop sisters, they have other interests as well. Both enjoy sports; Ana volunteers with the Association of Professional Engineers and Geoscientists of B.C.'s career awareness program and Microsoft's student community program, and Cristina loves to write poetry and volunteers with the UBC Physics Olympics.

Although Ana and Cristina became interested in engineering at an early age, they recognized that many other young women are not savvy to the opportunities available to them. In order to pique young women's interest in engineering, the Pop sisters recommend getting successful women engineers to talk to high school and even primary school students. Perhaps one day Ana and Cristina will be these successful engineers sharing their experiences.

Upon graduating at age 19 and 18 respectively, Ana and Cristina both plan to pursue doctoral degrees directly and either work for a major software company or run that company!

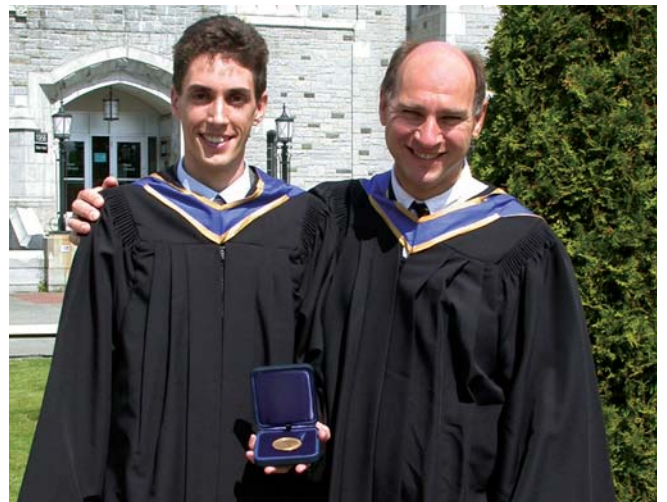
Ana (left) and Cristina Pop have utilized the UBC Transition Program to enter university at the early age of 16 and 15 respectively.

Governor General's Gold Medal winner heads to Harvard

Our congratulations go out to Simon DiMaio who was presented with the Governor General's Gold Medal by President Martha Piper at the spring convocation ceremony on June 1. The highest honour available to graduate students in Canada, this award is given to the student whose record, in the opinion of the Faculty of Graduate Studies, is the best in the graduating class for the doctoral degree.

Simon received a B.Sc. from the University of Cape Town, South Africa, and an M.A.Sc. from UBC. Simon's Ph.D. research was in the area of medical image computing and computer aided intervention, particularly needle insertion modelling and simulation. "I chose to stay at UBC to do a Ph.D. with Dr. Salcudean, mainly because of his reputation, resources and excellent supervising style. It turned out to be a good choice!" said Simon, who is now a post-doctoral fellow in radiology at Harvard University.

Simon DiMaio (left) shows off his gold medal with support from his Ph.D. supervisor, Electrical and Computer Engineering Professor Tim Salcudean.



Environmental Engineering students arrive

First cohort from UNBC begin their third year at UBC

In the spring/summer 2002 issue of *Ingenuity*, we announced the establishment of a new degree program in Environmental Engineering offered jointly through UBC and the University of Northern B.C. (UNBC). This unique program is the first in B.C. to offer full-time studies in environmental engineering, and the first in Canada to provide graduates with a Bachelor of Applied Science from two universities. Students spend the first two years at UNBC, the third and fourth years at UBC and the final term back at UNBC.

Having now completed their first two years at UNBC, the first cohort of third-year students were welcomed to the UBC campus this September.

In preparation for their relocation from Prince George to Vancouver, the Faculty had earlier invited the first- and second-year students to tour facilities at UBC and familiarize themselves with their co-alma mater. Thirteen students were flown in for a four-day orientation. According to Dr. Sheldon Duff, Program Co-director, the students were enthusiastic after the visit,



saying they “couldn’t wait” to get here.

We are pleased to report that word is spreading about this innovative new program and enrolment is growing. This year 23 new students were admitted to the program, which is a

First- and second-year environmental engineering students give the “thumbs up” to their new school.

significant increase from previous years and bodes well for the future of this unique program.

When green is gold... Continued from page 1

Complementing her study of biodiesel, Ellis also researches bio-oil. Produced from wood waste, bio-oil is created by pyrolysis—a process in which wood and wood waste is vaporized (heated without oxygen and without burning). Wood waste is heated by utilizing the recycle stream of the process in a fluidized bed, which suspends solid fuels on upward-blowing jets of air during the heating process, resulting in a turbulent mixing of gas and solids. The tumbling action, much like a bubbling fluid, provides more effective chemical reactions and heat transfer. The vapourized gases produced in the fluidized beds are condensed to produce bio-oil.

The product is a thick black liquid with a smoky odour, which can serve as an alternative source of sustainable energy for diesel engines, gas turbines and heating. Like biodiesel, bio-oil is a carbon-neutral energy source, which provides an opportunity to reduce reliance on fossil fuel. And the benefit of bio-oil is not limited to its use as a fuel. By recycling biomass such as wood and agricultural waste, we mitigate the problem of having these wastes decompose in landfill sites and produce methane gases, which have much worse global warming potential than CO₂.

Although bio-oil has great potential benefits, its

high viscosity, high acidity and high structural water content make it difficult to burn. In collaboration with department colleagues, Professors Sheldon Duff, Kevin Smith and Paul Watkinson, Ellis is investigating different ways to upgrade bio-oil. They are exploring combinations of the two immiscible fuels, bio-oil and biodiesel, to create a stable emulsion and a fuel that has lower viscosity and higher calorific values than bio-oil alone and is easier to ignite. Hers is the first study of upgrading bio-oil through emulsification with biodiesel. The results from the study will provide data needed to implement the upgrading of bio-oil on a large scale and make bio-oil

suitable for widespread use as a fuel and chemical.

Ellis’ interest in chemical engineering surfaced in high school when she discovered that by pursuing this field, she could help the environment by reducing waste and emissions. She hopes to pass on this sense of corporate citizenship and environmental compassion to her engineering students. “To become an engineer who thinks about environmental impact, the ecological footprint, living on this earth and sharing it—that’s truly enhancing a technical education,” said Ellis. “These elements of compassion will shape the next generation.”

Striving to maintain excellence

Yes, I would like to support the Faculty of Applied Science

Name:

Address for tax receipt:

- I would like to make a tax-deductible donation of \$ _____, which will be directed to the *Faculty of Applied Science Endowment Fund for Student Support*. (Please make cheque payable to "The University of British Columbia.")
- I would like my gift to be directed to a specific department or program. (please specify)

- I would like my gift to remain anonymous.

Please return to:

Development Office

Faculty of Applied Science
The University of British Columbia
2006-2324 Main Mall
Vancouver, BC V6T 1Z4

Tel: 604-822-8335
Fax: 604-822-0688
E-mail: development@apsc.ubc.ca
Web: www.apsc.ubc.ca/development

For internal use only:
Fund ID: E486 Gift Source: F548

Viking ID: _____

This September has seen the Faculty welcome one of the largest classes of engineering students to date. For us in the Development Office, the increasing enrollment serves to remind us of the continual need for student and research support. As ever, we are striving this year to ensure that B.C.'s largest engineering school is able to maintain its excellent educational and research programs, as well as its modern facilities, so that we can continue to provide for the engineering needs of B.C. and Canada.

We are pleased to have had the opportunity to celebrate a few leading gifts since the spring *Ingenuity*.

Nortel Networks donated a multi-million dollar gift of hardware and software. Bell Canada announced a \$1.25 million commitment to UBC as part of the Bell University Labs initiative, which will support a series of technology research initiatives. The late Mr. Norman Freshwater gifted, through his estate, \$550,000 to establish bursaries for mining engineering students. And the Ozeki family donated 14 pieces of artwork for the new buildings under construction.

From the Applied Science Development team, the Faculty, and UBC, I would like to express our sincere appreciation for



the continued support of all our alumni and friends.

Should you want to find out more about our Development priority projects for this year, please contact me at 604-822-1329 or hillary.gosselin@ubc.ca. We look forward to working with you to make this year as successful as the last!

Hillary Gosselin
Manager of Development

Ozeki family to donate art for new Applied Science buildings

The family of renowned Japanese leather formative artist Kazuko Ozeki has donated 14 of her works of art to the Faculty of Applied Science. The works, valued at a total of approximately \$200,000, will be used to adorn the walls of the new Fred Kaiser building, scheduled for completion early in 2005, and possibly of the new Chemical and Biological Engineering building, currently scheduled for completion in fall 2005.

Ms. Ozeki's work has been exhibited at the Tokyo Art Gallery and the Japanese Modern Craft

Exhibition, and was until recently displayed at a number of Vancouver locations, including the Pan Pacific Hotel. Her works are highly valued by private collectors in Japan, Europe, and North America, and she has been presented with a number of notable awards, including the NHK Kaichosho, the chairperson's award of the NHK, a renowned Japanese broadcasting institution. Ms. Ozeki is a member of the Japanese art academies Nitten (Japan's most authoritative art group), Gendai Kogei (contemporary

craft), and Do Oro Ten (the group of golden ten), as well as the Crafts Association of B.C. The leather montages, which play with colour and form, will be a thought-provoking and enriching addition to the contemporary buildings.



Ms. Ozeki's *A Child of Fancy*.

Nortel Networks joins with UBC to create Canada's best telecommunications laboratory

On March 23, the Faculty of Applied Science welcomed top executives from Nortel Networks to UBC to celebrate Nortel's recent donation of \$9.2 million of hardware and software to the Faculty. The event was attended by Dr. Martha Piper, President of UBC, Ron McDougall, Vice-President Enterprise Canadian Sales, and Don Avison, President of The University Presidents' Council of B.C., who, together with Dean Michael Isaacson, all commented on the tremendous value of the equipment to UBC's researchers, and the ensuing collaborative research relationship.

"Nortel's generous gift helps position UBC as a leader in telecommunications research," said UBC

President Martha Piper. "We're extremely pleased to have their support and to become the hub of this important research network that will benefit the economies of British Columbia and Canada."

In addition to the initial donation of broadband networking technology, Nortel will also act as technology advisor, providing an industry partner for UBC researchers. "The faculty members in Applied Science are extremely pleased to be working with one of Canada's top telecommunications companies," commented Dean Isaacson. "This partnership will increase our capabilities to tackle larger research problems, and propel research in internet technologies."

Student representative Sameer Chandani spoke at the event, and noted that the Nortel gift "will not only greatly enhance the education of all students in Electrical and Computer Engineering, but will also give a boost to the careers of ECE students as well." Few other universities can offer students the opportunity to work with this equipment for their research projects. A hands-on approach will allow UBC students to experience the technology and then make immediate and important contributions once they head out into industry.

The contribution from Nortel is an excellent complement to the recent government initiative to increase the number of ECE

graduates in B.C. "This is truly an impressive development that will enhance innovation opportunities for researchers and students," said Don Avison, President of The University Presidents' Council of British Columbia. "Nortel's donation is particularly encouraging as it comes at a time when our universities are working in partnership with the B.C. government and industry to double the number of graduates in electrical and computer engineering and computer science."

The equipment will be housed in various laboratories, including some in the new Fred Kaiser building that will house the Department of Electrical and Computer Engineering once it is completed early in 2005.



Above (from left): Sameer Chandani, ECE Ph.D. candidate, Ron McDougall, Vice President Enterprise Canadian Sales, Nortel Networks, Dr. Martha Piper, President of UBC, Dr. Michael Isaacson, Dean of Applied Science, and Don Avison, President, The University Presidents' Council of B.C., at the Nortel announcement.



Above right (from left): Sameer Chandani, Dr. Nick Jaeger, Don Avison, and Dr. Hussein Alnuweiri. Drs. Jaeger and Alnuweiri will be major users of the equipment.



Right: Ron McDougall (left) and Sameer Chandani.

Alumni update

More and more we have received the message from alumni that they would like greater involvement with the Faculty—to hear how programs have changed, to learn about our latest research developments, to help with our fundraising campaign, to mentor current students, and so on.

Five years ago, Dean Isaacson had a thought—“build a strong alumni-Faculty relationship.” Five years later, a lot has been achieved. Presently, we have alumni from all engineering disciplines actively involved in Faculty matters through their participation at mentoring events, sitting on department advisory councils, and assisting with our fundraising initiatives, to name a few. I, along with the Dean, faculty members, staff and students have the opportunity to visit and meet with many of you at class reunions and at receptions hosted locally and in other cities in North America. Your enthusiasm and zeal in wanting to be involved with your alma mater makes my job as the Alumni Relations Officer a whole lot easier. Thank you!!

If you would like to be involved in organizing your class reunion or would like to participate in our other alumni and Faculty activities, please contact me by phone at (604) 822-9454 or by e-mail at mcordeiro@apsc.ubc.ca.

I am pleased to provide you with the highlights of some of the class reunions and receptions that have taken place since the last issue of *Ingenuity* was published.



May Cordeiro
Alumni Relations Officer

2004 Reunion Highlights

MECH'69—35th Reunion—April 2004

The Mechanical Engineering Class of 1969 (right) held its 35th reunion during the weekend of April 16, 2004. Twenty-three members of the class and their partners enjoyed an evening of dining at the Royal Vancouver Yacht Club followed by a Saturday cruise and overnight stay at Wigwam Inn. (Photograph and text courtesy of Al Tippett.)

Front row, from left: Dex Olund, Ron Wensel, Al McLeod, Mike Foster, Danielle Earhart, Al Tippett; second row: Tony Orchard, Doug Lunam, Jeet Shergill; third row: Dave Baker, Bob Cameron, Kee San Chow, Jens Henriksen; fourth row: Ed Lee, Ron Jupp, Don Workman, Simon Engel; back row: Murray Hendren, Al Little, Bill Prinz, and Jim McDonald.



Washington Breakfast—May 6, 2004

Our Washington State engineering alumni (left) met for breakfast with Dean Isaacson (centre) at the Hotel Monaco in downtown Seattle on the morning of May 6. The meeting included a lively discussion, which provided some excellent feedback for the Faculty.

Calgary Reception—June 3, 2004

Alberta engineering alumni attended a reception hosted by Dean Isaacson at the Hyatt Regency Calgary. The Dean provided guests with updates on the various academic, co-op education, research and fundraising activities in the Faculty. Visuals of the new Electrical and Computer Engineering, and



Dean Isaacson (right) updated alumni on recent developments in their alma mater.

Chemical and Biological Engineering buildings were made available through a power-point presentation. We were pleased with the high turnout of loyal alumni, considering that the Calgary Flames played their final Stanley Cup game that night!



Alberta alumni enjoyed a chance to network with each other during the reception.

CHML'64—40th Reunion—June 24-26, 2004

The Chemical Engineering Class of 1964 (right) has maintained close contact over the years, holding several reunions and keeping tabs on each other through an annual newsletter. The gathering for the 40th reunion was special. Several locations were proposed, and in the end Vancouver, the perennial favourite, won out. At the end of June, 17 out of 24 classmates attended events with their spouses. Golf on Friday followed by a casual dinner gathering along the Fraser River kicked off the weekend. The highlight was a UBC tour of the old haunts that ended with a Sage Bistro luncheon hosted by Dean Isaacson and attended by Department Head Kevin Smith and Professors Emeriti Pinder and Epstein. Toasts were exchanged by the Dean, and Gord Thomson and Lawford Duprés on behalf of the class. To commemorate the event, the class contributed to the new Chemical and Biological Engineering building now under construction. The reunion concluded with a celebration at a fine Yaletown restaurant. (Photograph and text courtesy of Peter Shepard.)



From left, kneeling: Jim McClennan, John Morgan, Peter Shepard, George Percy, Bernie Poplack, Ken Pinder, Norm Epstein; standing: Ed Fyfe, Kevin Smith, Ron Anderson, Tom Skupa, Jeff Eng, Walter Hogg, Lawford Duprés, Gord Thomson, Ron Pratt, Don Macdonald, and Peter Ambrose.

EECE'60-'90—Annual Event—August 19, 2004

This annual event (left) drew approximately 110 graduates, most of who live in and around the lower mainland. Enjoying great weather and excellent food, alumni spent time catching up with each other and with their former professors. Professor Michael Davies spoke on new developments in the Department; Professor Emeritus K.D. Srivastava provided guests with some insight into the significant increases in student admissions into the Department's programs; and Professor Rabab Ward, Director of the Institute for Computing, Information and Cognitive Systems, updated alumni on recent activities within the Institute.





CHML'69—35th Reunion—August 21, 2004

The 35-year reunion of the Chemical Engineering Class of 1969 (left) was held at Whistler, B.C., on the weekend of August 21, 2004. Our numbers were small due to short notice, but what we lacked in numbers, we made up for with great enthusiasm! (Photograph and text courtesy of Art Quan.)

Left (seated, from left): Warren Smith, Brian Schofield, Terri Cooper, Chovine Schofield, Barbara Dabrowski, Jay Hamilton, Judy Rieder; standing, from left: Rob Matthews, Judy Duncan, Paul Duncan, Bob Shepherd, Bob Rieder, Wendy Smith, and Art Quan. Attendees not in the photo: Wendy Quan, and Terry and Jennifer Roberts.

BASC'54, '64 & '74—Milestone Reunions

The Class of 1954 (right) hold up their glasses to toast 50 years of success since graduating. Nursing graduate June Talbot (far right) found herself in good company as the only female amongst the all-male engineers in attendance at the luncheon on Friday, October 1.

Other milestone reunions in October 2004 included the 40th reunion of the Class of 1964 (lower left) on Sunday, October 3; and the 30th reunion of the Class of 1974 (lower right) on Wednesday, October 6.



Upcoming events

Regional alumni events:

California reception—Nov. 18, 2004; Toronto reception—Nov. 25, 2004.

UBC Electrical and Computer Engineering Industry Dinner: The UBC ECE Club will be hosting an industry dinner on January 21, 2005, at the Hyatt Regency Vancouver Hotel. This event will be a great opportunity for professionals to participate in the educational and career development of future engineers. Companies will also have the chance to showcase themselves to the engineering community. Three guest speakers will focus on topics such as industry trends, the future of engineering, and available career paths for graduates. The dinner promises to be an event full of learning, gourmet food, and fun. For tickets, general questions or comments, please e-mail industrydinner@ubcengineers.ca.

Detailed information on events planned for 2005 will be mailed in the coming months. If you would like to get involved or have any questions, please contact me by phone at 604-822-9454 or by e-mail at mcordeiro@apsc.ubc.ca.

Bell Canada brings the Bell University Laboratories program to UBC

In May 2004, Bell Canada announced a \$1.25 million commitment to The University of British Columbia as part of the Bell University Laboratories (BUL) initiative. The five-year commitment is the first in western Canada for the BUL program, and will support a series of research initiatives.

The BUL program, established in 1998, brings together Bell Canada professionals with the Canadian university research community in key strategic areas of wireline and wireless communications, e-business, new media, human-computer interaction, and e-health applications. The philosophy behind Bell's support surmises that generating innovation in today's market takes an unprecedented amount of cooperation, which is facilitated with this initiative.

Since the inception of the program, Bell University Laboratories has committed over \$33 million to research projects at Ontario, Quebec, and Atlantic Canada institutions and research centres. Currently, with more than 24 universities across Canada participating in BUL initiatives, the program provides innovative and cutting-edge work environments for more than 600 students and researchers.

"We are very pleased to be part of such an important research collaboration," commented Dean Michael Isaacson. "The Bell University Laboratories program is an excellent example of how partnerships between industry and academia can move forward progress in new technologies more quickly and successfully than working independently. Collaboration not only benefits industry and academia, but our society and economy as well."

"Bell has a proud tradition of supporting and advancing communications across Canada with programs like Bell University Laboratories," said Paul Healey, President of Western Canada for Bell. "Bell University Laboratories' \$5 million investment in western Canada reflects our commitment to innovation and to research institutions in Alberta and B.C."

Bell is currently exploring a number of potential projects with researchers at UBC and creating a governance process with equal UBC and Bell representation. The goal of this will be to ensure that the projects funded not only potentially have value to Bell, but also are academically excellent. Research projects currently proposed for funding have a focus on wireless technology and social computing. Current

projects underway through BUL at other institutions span a wide range of communications-related topics, and include computer interface modifications for elderly, ill, or handicapped persons; user-centred design of wireless multi-media applications; e-commerce innovations; security and privacy in internet services; secure file recovery; biometrics-based authentication solutions; and datamining, to name a few.

With the rapid growth of technology in both wireless technology and social computing, Bell's contribution will bring exceptional new research and educational opportunities to faculty and students of Applied Science and UBC, and will foster long-term research capability and economic growth, bringing tangible benefits to both parties.

UBC grad gives back to mining engineers

The Faculty of Applied Science recently received a gift of \$550,000 from the estate of Norman Gavin Morgan Freshwater (B.A. Geology 1929; M.A. 1931) to provide bursaries to mining engineering students. The bursaries, which will be made available in fall 2005, will provide \$27,500 for mining students with identified financial need.

Mr. Freshwater, a former Vancouver high school teacher who would have been 100 this year, set up this bequest in his will prior to his death in March 2004.

We would like to extend our sincere thanks and appreciation to Mr. Freshwater and all those alumni whose planned gifts will ensure a legacy of support for engineering students.

International and interdisciplinary

NUS-UBC Applied Science Research Centre opens its doors to researchers

UBC recently signed a Memorandum of Understanding (MOU) establishing a new international, interdisciplinary research collaboration with the National University of Singapore (NUS) —

the NUS-UBC Applied Science Research Centre.

The Centre was the brainchild of UBC Mechanical Engineering Professor Clarence de Silva ten years ago while on sabbatical at NUS.

De Silva, an expert in the area of intelligent control, robotics and process automation, now serves as the Director of the UBC hub of the Centre.

“When I first proposed this idea to Dean Isaacson, he was most enthusiastic and was the first to commit funding to support it, for which I am extremely appreciative,” said de Silva. “On June 1, the MOU was signed by all parties, funding is in place, and exciting research has begun.”

The Centre involves collaborative projects between researchers at both

universities, as well as some researchers from other B.C. universities. A significant criterion for projects will be the practical applicability of the research.

Initially, eight collaborative research projects between UBC and NUS researchers have been funded by NUS in the first round, on subjects ranging from information and communication technology, and industrial control and mechatronics to virtual reality, advanced materials, and drug kinetics.

ICCS



Centre Director Clarence de Silva with his Intelligent Iron Butcher, a fish cutting machine designed and developed in his laboratory.

Engineering Mentoring Program proceeds

Pilot project proves successful

In January 2004, the Faculty of Applied Science, UBC Career Services and the Division for the Advancement of Women in Engineering and Geoscience of the Association of Professional Engineers and Geoscientists of B.C. successfully piloted an Engineering Mentoring Program.

According to Dr. Elizabeth Croft, Associate Professor of Mechanical Engineering and champion for the establishment of this program, “we received very positive reviews from the 45 female students and mentors who participated last year. Therefore, the program was expanded to 120 participants this fall and now includes

both male and female students and mentors.” With 200 student applications for 80 places and 70 mentor applications for 40 places, demand for this program is high and further expansion is anticipated for the future.

The program, which runs from October to March, operates in a tri-mentoring format, bringing together a professional engineer as a mentor to a senior and junior student. Both students receive early insight into the world of professional engineering, but this unique group structure also allows the senior student to learn to mentor a junior student, providing helpful course and study advice.

For detailed information and application instructions, visit <http://batman.mech.ubc.ca/~daweg/mentoring>.

From left: UBC alumna Mary Boulanger (B.A.Sc. '87/M.A.Sc. '95), a civil engineer with NovaTec, mentored second-year electrical and computer engineering student Xue Jiang and fourth-year civil engineering student Robin Ng during the pilot year of the program.

Donna Dykeman



Deans from around the world converge

Faculty hosts U21 Engineering Deans Council

Universitas 21 (U21) is an association of universities from around the globe who collaborate to address the opportunities and challenges faced by research-intensive universities in the 21st century. Within U21, the U21 Engineering Deans Council meets periodically, and this year, from May 2-4, the Council met at UBC, with 17 representatives from 12 international universities.

The meeting shared experiences and exchanged views on a wide range of topics, such as educational quality, funding, fees, research, student support, infrastructure, management and trends in education.

During the visit, the Faculty hosted a dinner with faculty members and university administrators, as well as government and industry representatives. The keynote address at this dinner was provided by Stan Cowdell, President of Westmar Consultants Inc.

Providing a glimpse into the field of engineering consulting, Cowdell focused on some of the important trends and challenges facing industry and the significant role universities play in helping to address these challenges. He posed the question, “how can a consulting firm compete in an international marketplace which is trending to commodize basic engineering services when other

countries face far lower salary costs?” The answer for his company is selling higher value and more creative solutions.

Cowdell confirmed that industry is looking to universities to help develop these advanced solutions by graduating engineers with excellent technical skills combined with critical-thinking skills, or metaskills. “The vast majority of our projects cannot be completed by a sole practitioner,” said Cowdell. “Team members need to be able to communicate, support, and contradict within an environment that does not impair creativity and accuracy.”

He continued to highlight the non-technical skills his company selects for:

- excellent verbal and written communication skills;
- effective listening;
- mental energy—being thorough in ones work;
- willingness to learn from others, combined with an attitude of continuous learning;
- integrity;
- imagination;
- flexibility, enthusiasm and energy;
- compassion;
- courage; and
- self-awareness and a willingness to change.

“Metaskills are not only essential for engineers to work together to develop the best technical solutions for society, they are also

necessary for us to have the strength to remain true to our values and then to communicate the benefits of our work to society in a way that will be understood, accepted and valued,” said Cowdell.

Whether they are called critical-thinking skills, non-technical skills or metaskills, there can be little doubt that engineers graduating with these skills have received a super-sized education.

“Engineers have become the interpreters of technology for society, examining the needs, identifying effects and arbitrating value,” said Stan Cowdell, President of Westmar Consultants Inc.



From left: UBC Associate Dean Bruce Dunwoody, University of Glasgow Dean John Hancock, and Engineering Consultant Shahid Hussain at the dinner on May 3.

Faculty's latest CRC

Improving quality of life, one tiny biosensor at a time

If you are one of the two and a quarter million Canadians who suffer from diabetes, you already know all too well about the importance of monitoring glucose levels. Tired of those daily blood tests? Mechanical Engineering Assistant Professor Mu Chiao may soon have some relief from that.

The latest Canada Research Chair (CRC) to be appointed within the Faculty, Chiao is an expert in microelectro-mechanical systems (MEMS)—currently one of the hottest areas of mechanical engineering. Trained

at one of the world's leading research centres for MEMS—the University of California, Berkeley's Sensor and Actuator Center, Chiao had been conducting high-calibre research there for nearly four years before joining the Faculty in September 2003. His aim is to establish a leading-edge interdisciplinary research program in MEMS and nanotechnology at UBC.

Chiao is especially interested in biomedical applications such as implantable biosensors and drug delivery systems. Technical barriers such as

excessive power consumption and faulty packaging currently prevent implantable devices from being reliable and marketable; however, patients with chronic diseases have a need for novel health monitoring technology and drug delivery systems.

By applying MEMS and nanoengineering to bio-medical applications, Chiao is working to advance implantable technology and improve the quality of life for millions of patients. For instance, he is working on improving the reliability of tiny biosensors that will be implanted in patients



Professor Chiao's implantable biosensors could one day bring welcome relief to chronic disease sufferers.

to monitor their glucose levels. The biosensor would transmit glucose levels to a handheld device similar to a palm pilot, saving the weary fingers of the world's diabetic community.

The Faculty mourns the passing of a friend and colleague



The Faculty of Applied Science sadly reports that Dr. Dale Cherchas, Professor in the Department of Mechanical Engineering for 22 years, passed away on March 20, 2004, in Vancouver at the age of 59.

Dr. Cherchas received his B.A.Sc. degree in engineering physics from UBC in 1967 and went on to receive his M.A.Sc. and Ph.D. degrees in space

dynamics from the University of Toronto. He began his career with Spar Aerospace in 1971, and in 1972 was hired by the University of Toronto as Assistant Professor. He joined UBC as Associate Professor in 1982.

A thorough and dedicated scholar, Dr. Cherchas specialized in automatic control of systems and processing using digital computers, particularly in the areas of robotics and computer-aided manufacturing. He also

served the university in several administrative roles; including Assistant Head from July 1983 to June 1984; Acting Head from July 1999 to June 2000; and Associate Dean Research and External from August 2002 until his illness in spring 2003.

As well, Dr. Cherchas was instrumental in the publication of the book "Discovery by Design—the origins and history of the Department of Mechanical Engineering, 1907-2001" by Dr. Eric Damer. He led the initiative to develop the book and was a constant source of support and encouragement to Dr. Damer.

The Faculty is fortunate to have had such a wonderful professor, colleague and role model. He will be fondly remembered by all who knew him.

The Dale Cherchas Memorial Scholarship has been established in memory of Dr. Cherchas to support deserving mechanical engineering students based on academic excellence. Tax receipts will be issued. Donations may be sent to:

The UBC Fund
6253 N.W. Marine Drive
Vancouver, BC V6T 1Z1

Tel: (604) 822-4293
Fax: (604) 822-8151

Dean receives honour

at international offshore engineering conference

Dean Isaacson was honoured at the 23rd International Offshore Mechanics and Arctic Engineering Conference held in Vancouver from June 20-25, through the naming of the “Michael Isaacson Specialty Sessions in Offshore Hydrodynamics.” The honour acknowledges his significant contributions to the study of wave hydrodynamics and coastal engineering.

Department of Mechanical Engineering faculty members Sander Calisal and Jon Mikkelsen worked extensively to bring this prestigious international conference to Vancouver. The conference, which was co-chaired by Calisal and Mikkelsen, provided an interactive forum for the world’s top academic and industry leaders in offshore engineering, and had approximately 550 delegates from over 28 countries.

The conference also included a specialty forum “Engineering B.C.’s Offshore Development: Challenges and Opportunities,” with expert commentary from the oil and gas industry, the fishing and marine industry, engineering and environmental organizations, First Nations committees, as well as from government and universities.

On the evening of June 24, the conference hosted a dinner in Dean Isaacson’s honour. In attendance were some of his former graduate students, graduating from as early as 1979, as well as colleagues from UBC and industry.

One of the Dean’s former Ph.D. students present was Dr. Shankar Bhat, who was an organizer of the event and who now works with the Shell Oil Company in Houston, Texas. “I am immensely grateful for Dr. Isaacson’s mentorship,” said Bhat. “We graduates were so pleased to attend this dinner to acknowledge his significant contributions to our futures. I take great pride in being a member of his elite team.” Many of his students have gone on to hold senior positions in the offshore engineering and consulting engineering industries.

Dean Isaacson and his wife, Sharon, had a chance to catch up with some of his former graduate students at the conference. From left: Shankar Bhat, Sundar Prasad, Chris Niwinski, Mehernosh Irani, Sharon Isaacson, Enda O’Sullivan, Michael Isaacson, Sundarlinga Premasiri, Gang Yang, Eric Morris and Thomas Mathai.



Appointments

Civil Engineering

Jacqueline Jenkins was appointed Assistant Professor on July 1. Her research expertise is in the area of transportation safety, specifically the influence of users in the planning, design and operation of transportation facilities.

Electrical and Computer Engineering

Patrick Palmer was appointed Associate Professor on July 1. His research concentrates on the detailed behaviour of existing and emerging power semiconductor devices and fuel cells in a wide range of practical systems related to electrical power conversion and control.

Z. Jane Wang was appointed Assistant Professor on August 1. Her research interests are in the general areas of statistical signal processing, biomedical imaging, genomic signal processing, information security, and wireless communications.

Change of Address

With the recent naming of Applied Science Lane off East Mall between the Civil and Mechanical Engineering (CEME) building and the CEME Annex (Rusty Hut), the Departments of Civil and Mechanical Engineering now have a new address:

6250 Applied Science Lane
Vancouver, BC V6T 1Z4

Achievements

Chemical and Biological Engineering Professor Emeritus **Paul Watkinson** has been elected a Fellow of the Canadian Academy of Engineering.

Civil Engineering Professor and Associate Dean **Perry Adebar** has been honoured with the 2004 Meritorious Achievement Award from the Association of Professional Engineers and Geoscientists of B.C.

Civil Engineering Professor **Nemkumar Banthia** has been elected a Fellow of the Canadian Academy of Engineering.

Civil Engineering Professor **Jonathan Fannin** has received two distinctive honours. He was awarded a UBC Killam Teaching Prize; and he has received a Terzaghi Fellowship from the Norwegian Geotechnical Institute.

Civil Engineering Professor Emeritus **Bill Oldham** has received the 2004 Gordon Maskew Fair Medal for Outstanding Service in Engineering Education from the Water Environment Federation.

Civil Engineering Associate Professor **Helmut Prion** has received the 2004 Medal for Distinction in Engineering Education from the Canadian Council of Professional Engineers.

Civil Engineering Professor **Tarek Sayed** has been named a UBC Distinguished University Scholar.

Electrical and Computer Engineering Professor and Department Head **Vijay Bhargava** has been honoured with the prestigious Thomas W. Eadie Medal from the Royal Society of Canada.

Electrical and Computer Engineering Professor **Guy Dumont**, along with co-authors G.E. Stewart & D.M. Gorinevsky, has received an Outstanding Paper award for a paper published in the IEEE Transactions on Control Systems Technology in 2002 and 2003.

Electrical and Computer Engineering Associate Professor **Sidney Fels** has been named a UBC Distinguished University Scholar.

Electrical and Computer Engineering Professor **Nicolas Jaeger** has received two distinctive honours. He has been awarded a UBC Killam Teaching Prize and the 2004 Medal for Outstanding Achievement in Applied Photonics from the Canadian Association of Physicists and the National Optics Institute.

Electrical and Computer Engineering Professor **Tim Salcudean**, Mechanical Engineering Associate Professor **Elizabeth Croft** and graduate student Diana Constantinescu have received a Best Paper Award at the 12th Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems held in Chicago, Illinois.

Electrical and Computer Engineering Assistant Professor **Robert Schober** has been honoured with the 2004 Vodafone Innovation Award from the Vodafone Foundation for Research in Mobile Communications in Germany.

Mechanical Engineering Assistant Professor **Mu Chiao** has been awarded a Canada Research Chair in microelectro- and nanoelectro-mechanical systems.

Mechanical Engineering Professor Emerita **Martha Salcudean** has been appointed an Officer of the Order of Canada.

Mechanical Engineering Professor **Gary Schajer** has received the 2004 Teaching Award in Engineering and Geoscience from the Association of Professional Engineers and Geoscientists of B.C.



Ingenuity is published by the Faculty of Applied Science, The University of British Columbia. www.apsc.ubc.ca

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Design and Production:

Tandem Design Associates Ltd.

Printing:

Rhino Print Solutions

The Faculty's engineering activities include the following:

Departments and Programs

- Chemical and Biological Engineering
- Civil Engineering
- Electrical and Computer Engineering
- Engineering Physics
- Environmental Engineering
- Geological Engineering
- Integrated Engineering
- Materials Engineering
- Mechanical Engineering
- Mining Engineering

Office of the Dean

- Business & Development Office
- Centre for Instructional Support
- Engineering Co-op Office
- Engineering Student Services
- Technical Communication Centre

The Faculty participates in several research centres and laboratories including:

- Advanced Materials and Process Engineering Laboratory (AMPEL)
- Clean Energy Research Centre (CERC)
- Institute for Computing, Information and Cognitive Systems (ICICS)
- Michael Smith Laboratories
- Pulp and Paper Centre

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PUBLICATIONS MAIL AGREEMENT
NO. 40602510
RETURN UNDELIVERABLE CANADIAN
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