



THE
UNIVERSITY OF
BRITISH
COLUMBIA

ingenuity

Faculty of Applied Science
Engineering News

INSIDE:

- Message from the Dean
- Variety, challenge, impact & importance
- Engineering Open House
- Engineering Advisory Council update
- Mystery E pyramid
- Faculty Development
- Alumni and friends honour Professor Epstein
- Chemical and Biological Engineering Building officially opens
- Alumni update
- Engineering undergraduates honoured
- Retirements
- Celebrating a record number of placements
- Tribute to Professor Parkinson
- Appointments
- Achievements
- Mech 2 innovative curriculum awarded

Small is beautiful

Engineered from the atomic level, new materials meet increasing demands

“Is it scandium?”

This is the question du jour among mountain-bike enthusiasts, and they’re willing to pay top dollar—upwards of \$2,500—for a frame constructed with it. Welcome to the world of high-performance sporting equipment, where participants pay a premium for gear. Strength of material can save athletes from devastating injury, and a single ounce can mean a competitive edge.

An expert in designing metals for mechanical performance, Assistant Professor Chad Sinclair studies nanostructured metals. Unlike traditional engineering materials, the internal structure of nanostructured metals is composed of sheets, ribbons or spheres separated by as little as a few atoms.

For instance, aluminum-scandium alloys used in high-performance mountain-bike frames contain scandium in the form of perfect spheres no more than five atoms in diameter, dispersed within the aluminum. It is these very small spheres that impart the strength to the lightweight aluminum bike frames.

“It’s a common adage in the industry—small is beautiful,” says Sinclair, referring to the creation of bulk materials from the smallest of particles.

Nanostructured materials can reflect properties that do not obey simple laws deduced for bulk materials but instead may offer extraordinary strength, hardness and resistance to fracture. In many cases these mechanical properties can be obtained in combination with other important properties, such as electrical and thermal conductivity, temperature resistance, low density and/or magnetic properties that make these materials relevant today and very promising for future applications.



Chad Sinclair holds a block of scandium aluminum composite, used in high-performance mountain bikes.

Sinclair is conducting pioneering research to develop materials on a microstructural scale. Microstructure refers to the lengthscales within a material that dictate its behaviour—such as how strong or hard it is.

A piece of metal may appear uniform, but it is in fact constructed of constituent crystals, in turn made up of sub-crystals that are in turn made from groupings of atoms. Each of these layers in the material is associated with a smaller and smaller length. The atom is the smallest length Sinclair works with.

Continued on page 5

Message

from the Dean



Welcome to the spring 2006 issue of *Ingenuity*. Since last I wrote, the Faculty has seen a number of exciting developments, all designed ultimately to enhance the quality of student learning and of our research activities.

The formal opening of the new Chemical and Biological Engineering Building took place on March 3, 2006. This is the culmination of a project that originally commenced more than a quarter of a century ago! The formal opening ceremony brought together government representatives, UBC dignitaries, industry partners, faculty, alumni, students and staff to celebrate the historic moment. The day's celebrations included a number of other activities. Events began with several alumni and friends gathering for the official opening of the Norman Epstein Reading Room — a room named in honour of Professor Epstein and his more than 50 years of service. Following the opening ceremony, was a reception, the Department offered building tours and during the afternoon a symposium “Chemical and Biological Engineering in the Coming Decades” was held with four keynote speakers. For details, please see pages 6 and 7.

On another front, Professor Emeritus Michael Davies has led the development of a Phase II Task Force Report addressing the ongoing development of Engineering at UBC Okanagan. The report made a number of important recommendations. These have included the need to develop a unique broadly-based second-year Engineering curriculum common to all disciplines leading to fully accreditable specializations in Civil, Mechanical and Electrical Engineering; a curriculum with strong project and laboratory components; and a pedagogy that encourages integration of learning across disciplines and fosters the skills needed to address broad technical issues. This recommendation has been adopted, so that, in addition to the first-year curriculum, *Engineering One*, there is now also a common second-year curriculum, *Engineering Two*. This is a notable departure from the Vancouver curriculum, and will lead to students receiving a broader engineering education with less specialization. As well, based on another recommendation of the report, I am pleased to announce the establishment of the Faculty's School of Engineering at UBC Okanagan.

I did want to touch on another development that is of potentially great significance.

For many years, the Faculty has had somewhat mixed levels of interaction with its industry partners, largely because of a rather rigid interpretation of UBC's Intellectual Property Policy. One of the challenges is that the nature of industry collaborations in engineering may be quite different from those in other disciplines — for instance, with research being more incremental, a greater possibility of multiple contributions to intellectual property, relatively short time scales, and so on — such that a model that may be best suited for some disciplines may not be so for engineering. This had impacted negatively on our multi-faceted relationship with companies, a relationship that covers such areas as co-op placements, collaborative research, guest lectures, site visits, advisory committees, donations and advocacy.

I am happy to report that, in response to a request from our Faculty and in fulfilling a recommendation in its May 2005 External Review Panel Report, the University-Industry Liaison Office (UILO) established the Sponsored-Research Task Force last fall. This is tasked to assess and make recommendations that relate to the Intellectual Property Policy particularly as it affects the areas of engineering and information technology. The Task Force includes representatives from the Faculty and the engineering industry. This has resulted in a set of guidelines on interpretations and procedures associated with the policy — guidelines that should be of great benefit both to our faculty members and to our industry partners. These have already been well received by several industry groups. I would like to express the Faculty's appreciation to Angus Livingstone, Managing Director of the UILO, for leading this important initiative.

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 UBC engineering 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>.

Variety, challenge, impact & importance

Satisfaction in a job well-done

Citing a recent report in *The Globe and Mail* correlating job satisfaction with variety and challenge, Professor Roger Beckie adds two elements to the mix — importance and impact. Whether it's helping the 90 or so students currently enrolled in the Geological Engineering Program or 80 million in Bangladesh through a groundwater research project, Beckie finds satisfaction in his work.

An engineer, Beckie oversees the interdisciplinary Geological Engineering program that is under the jurisdiction of the Dean of Applied Science but is housed in the Department of Earth and Ocean Sciences in the Faculty of Science. The undergraduate program leads to a B.A.Sc. degree in engineering.

For many, this interdisciplinary learning arrangement might seem challenging, but not for Beckie. He sees the relationship as beneficial for students, the organization and society.

"Students are allowed to select from a variety of challenging interdisciplinary courses from Civil and Mining Engineering, Earth Sciences, Forestry and Geography," says Beckie. "There's an amazing sense of cooperation among the departments and Faculties to help the students succeed."

Historically, there has been debate within Earth and Ocean Sciences as to why the Geological

Engineering program is held to the accreditation standards established by a non-university professional body — the Canadian Engineering Accreditation Board. But Beckie understands that this professional alignment is imperative to the success of the program and its graduates.

"Engineering is an applied science and needs to remain societally relevant," says Beckie. "In support of this, the Department of Earth and Ocean Sciences has made it a priority to hire faculty into Geological Engineering who are eligible for professional registration."

Initially appointed Program Director in 2001, Beckie has recently begun his second five-year term. His early goals for the program included streamlining the program and enhancing its profile.

"When I first became Director, Geological Engineering faced administrative challenges as far as offering too many course choices," says Beckie. "But Dean Isaacson and the previous Program Director Oldrich Hungry provided guidance to strategically focus the program. This has helped tremendously to deliver it effectively."

Streamlining has also helped Beckie achieve his second goal of advancing the program's reputation, and this will also carry-over to future goals.

"The program has long been held in high esteem with those who know us — industry hiring our graduates and the graduates themselves," says Beckie. "For the future it will be an objective to promote ourselves among those that are not familiar with the program — namely high school students and first-year engineering students."

Beckie would like potential students to recognize the Geological Engineering program as an opportunity for a career solving a variety of important, challenging problems, often having great societal impact. If that's not enough to entice one towards a satisfying career, other perks include working outdoors and traveling. Beckie himself is currently working on geological engineering projects in Peru, India and Bangladesh.

Apart from providing support for Geological Engineering undergraduate students, Beckie is also developing a comprehensive topic-focused program for graduate students who are interested in geological engineering.

"UBC has a critical mass by subject in civil, mining and geological engineering, as well as in geography and in hydrology," says Beckie. "This offering allows graduate students to pursue research in geological engineering and develop interdisciplinary collaborations."



Geological Engineering Program Director Roger Beckie.

Such collaborations are essential to Beckie's research. His current project — studying the cause and effect of groundwater arsenic in Bangladesh, and developing processes for evaluating, advising and guidance — requires input from a variety of experts in different fields and nations.

His research is of extreme importance to the 80 million or so people who rely on this groundwater for drinking. But Beckie describes his research in a very humble way.

"In the words of Winston Churchill, 'I'm a modest man with much to be modest about,'" says Beckie. "That's my guiding principle — do good, be humble."

Engineering Open House

On Friday March 10 and Saturday March 11, 2006 the Faculty opened its doors for an Engineering Open House in conjunction with UBC's Celebrate Research Week.



"I am floored by the enthusiasm of engineering students and faculty wanting to promote their programs," says Ruth Kwok, Recruitment Officer and event co-coordinator.

Each of the ten engineering programs and six departments were represented during the two-day event featuring more than 30 different interactive displays,

Voytek Klapotcz, Mechanical Engineering graduate student, describes his and Dan Vyselaar's research on a new parabolized hull that reduces drag and increases fuel efficiency.

contests, demonstrations and laboratory tours.

Highlights of the open house ranged from robotic martini makers to the earthquake shake-table to the hot steel runout table — representing the breadth of engineering study available at UBC.

The open house was well-attended and feedback has been very positive.

The Fred Kaiser Building lobby teeming with open house visitors.



Engineering Advisory Council update

The Engineering Advisory Council provides the Faculty with strategic guidance, helping to ensure the quality and relevance of our programs and research activities. The council meets regularly and is comprised of current and past company presidents and vice presidents, government officials and professional association representatives.

At the February 15 meeting, Dean Isaacson provided the Council with an update on engineering including the recent accreditation review; Associate Dean Perry Adebar presented an update on the UBC Okanagan School of Engineering activities and Associate Dean Bruce Dunwoody shared ideas for the new Centre for Engineering Career Development. Angus Livingstone, Managing Director of UBC's University-Industry Liaison Office, gave an update of revised guidelines relating to intellectual property issues. Council members provided valuable feedback on all these topics.

Thank you to our dedicated members of the Engineering Advisory Council, past and present. Current council members include:

Richard Auchinleck,
Former President & CEO,
Gulf Canada Resources

Wm. Gordon Bacon,
Former VP
Technology & Engineering,
Inco Limited

Denis Connor,
Chairman,
QuestAir Technologies Inc.

Harold Copping,
Former President & CEO,
Teleflex

Stanley Cowdell,
President,
Westmar Consultants Inc.

Patrick D. Daniel,
President & CEO,
Enbridge Inc.

Dick Fletcher,
Principal,
Urban Systems Ltd.

William Gallacher,
President & CEO,
Avenir Capital Corporation

Anne Garrett,
Executive Director & Registrar,
APEGBC

Sandeep Gupta,
Chairman,
Cryptic Corporation

Fred Kaiser,
Chairman & CEO,
Alpha Technologies Inc.

Henry Man,
President & CEO,
Magellen Developments Inc.

James A. McEwen,
President,
Western Clinical Engineering Ltd.

Alan Pelman,
VP Technology,
Weyerhaeuser Company Ltd.

Kevin Salvadori,
Executive VP,
Business Transformations & CIO,
TELUS

Thomas Simons,
Former Chairman & CEO,
Simons International Corp.

John F.H. Thompson,
VP Technology,
Teck Cominco Limited

Athol A. Trickett,
International Consultant,
Pulp & Paper

Mystery E pyramid

Food Bank receives welcome gift

On February 6, staff at the Greater Vancouver Food Bank Society was greeted by a cairn-shaped structure made of more than 800 cans of soup, carefully designed with a giant red E.

Found the Monday morning of Engineering Week (E-Week is a week of festivities organized by engineering students to celebrate their accomplishments), UBC engineering students are being credited

with the creative and thoughtful stunt, and the Food Bank is delighted.

“We’re going to leave it up as long as possible,” says Cheryl Prepchuk, Executive Director of the Food Bank, “to show there are university students out there who care about their community, who took the time — probably a couple of hours to construct the pyramid — to say we care about the people who are hungry in

our community and we want to make a difference.”

The Greater Vancouver Food Bank helps feed 25,000 people — 40% are children — in Vancouver, New Westminster, Burnaby and the North Shore. It receives most of its donations during December, so the mystery E was a most welcome surprise in February.

In general, UBC students are one of its largest



Vancouver Food Bank

The Mystery E cairn erected at the Vancouver Food Bank.

supporters, and on behalf of the staff, volunteers and recipients, the Food Bank would like to express thanks to those who donated the mysterious E pyramid.

Small is beautiful... Continued from page 1

“By experimenting with these scales, we can force materials to behave in a way that Mother Nature never intended,” says Sinclair. “We frustrate the material by inserting roadblocks in the form of internal boundaries.”

Imagine, for instance, a crack in a material. For the material to break, the crack must travel through the material. At each internal boundary, the crack is forced to change direction or to slow down, thereby frustrating the process of fracture. The more internal boundaries, the greater the force that must be applied to keep the crack moving through the material.

Using a concept similar to genetic engineering, Sinclair can select a desirable quality and replicate it from the most basic level, tailoring engineering materials from the atomic scale up.

Since his position commenced in the Department of Materials Engineering in 2001, Sinclair has worked on a variety of nanostructured materials, including aluminum-scandium alloys used in sporting-equipment and in aerospace industries, novel high-strength stainless steels used in the automotive industry and copper-niobium materials used in the construction of very

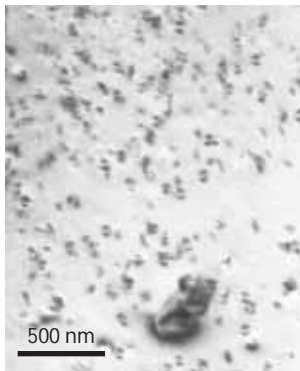


Fig A—This high-magnification image shows the scandium rich particles (dark) in the aluminum matrix (light) alloy for bikes. About 2,000 of these particles fit across the width of a human hair.

strong magnets used in magnetic-resonance imaging (MRI) machines.

The goal of his work has been to understand how and why these materials perform in the way that they do and to find new ways of fabricating advanced materials.

In the twenty-first century, demand for new materials is being driven by the need for increasingly

sophisticated combinations of properties — mechanical, electrical and optical — unavailable in traditional engineering materials.

Nanostructured metals appear well positioned to address the desideratum. As long as there is a desire for lighter, stronger, better, there will be an increasing impetus to make materials engineered from the atomic scale.



Fig B—The different colours in this lower-magnification image represent crystals in the alloy. The crystals shown are about the width of a human hair.

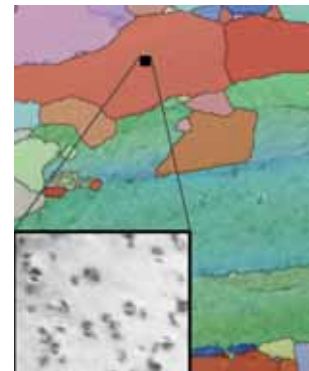


Fig C—The two images together show the relative scaling.

Fostering education & research

This year continues to be a year of impressive new developments for the Faculty. In the fall issue of *Ingenuity*, we highlighted the opening of the Fred Kaiser Building. This spring we were pleased to officially open the new Chemical and Biological Engineering Building, an addition to the Faculty's infrastructure that has been a priority for many years.

One of the most remarkable features about the creation of this new building was the outpouring of support from alumni,

faculty and friends who volunteered their time and expertise, and made financial contributions to ensure its success.

Thanks to their assistance, we now have a state-of-the-art building for chemical and biological engineering that will foster outstanding educational and research programs. It speaks clearly to the power of the individual to effect important and progressive change.

Over these two pages, we highlight our building donors as well as the alumni-led initiative to honour Professor Norman Epstein and his 50 plus

years in chemical engineering. You will notice the vast majority of the names are those of individuals. We would like to honour each person and institution that made a contribution to the building and we would like to extend our thanks on behalf of engineering students and faculty.

If you have ever wondered whether your contribution to the Faculty makes a difference, I hope you find inspiration, as I did, in these features. Your personal contributions to UBC Engineering, to students and programs, help us to



build, grow and create a Faculty that will continue to provide the best in education and research well into the future. All gifts make a difference.

Hillary Gosselin

Director of Development
hillary.gosselin@ubc.ca
604-822-1329

Alumni and friends honour Professor Epstein

In conjunction with the Chemical and Biological Engineering Building opening on March 3, a special ceremony was held to open the Norman Epstein Reading Room.

Made possible through contributions of alumni, students, colleagues and friends of Professor Epstein and matching funds by the Faculty, the reading room is a tribute to a faculty member who has made teaching and research contributions for more than half a century.

The reading room houses resources for undergraduates, graduates and faculty members including

computers and workstations, as well as a wide range of print materials specific to chemical and biological engineering.

After a welcome by Department Head Kevin Smith, Dean Isaacson expressed his appreciation to the alumni, friends and colleagues who made contributions towards this legacy.

Ross Craigie (B.A.Sc. '60) and his wife Barbara, were the lead donors to the reading room. Mr. Craigie spoke briefly of his memories of UBC and of Professor Epstein.

Other speakers included chemical engineering Professor John Grace, honouring Epstein's contributions as a faculty member, Graeme Young, speaking on behalf of current students, and Professor Epstein himself.

After sharing his deconstruction of the four words — Norman Epstein Reading Room — Professor Epstein thanked everyone for coming and shared his everlasting enthusiasm for the department and research.

"I'm most honoured by your attendance and by the whole occasion," said Epstein, "but remember, this is just the mini event before the maxi-event and the major, major, major event this afternoon, the symposium."

The Faculty of Applied Science would like to extend its appreciation to all the alumni and friends — especially Ross and Barbara Craigie for their leadership — who contributed to make the Norman Epstein Reading Room a reality.



Martin Dee/UBC Telestudios

From left: Michael Isaacson, Ross Craigie, Kevin Smith, Norman Epstein, Graeme Young and John Grace.

Chemical and Biological Engineering Building officially opens

Thanks to our donors

The opening of the new Chemical and Biological Engineering Building was a major milestone for the Faculty, one that had been an ongoing priority for more than twenty-five years. It is an accomplishment that could not have been achieved without the generous support of a wide range of alumni and friends, and we would like to extend our thanks to each person and company who came forward to make a contribution to this crucially important development.

Listed below in alphabetical order are our generous donors to the Chemical and Biological Engineering Building*, each of whom contributed \$1,000 or more:

Robert Affleck	Leslie Galloway	Peter Nelson	Peter Shepard
Ronald Anderson	Eileen Epstein Garber	Eric Newell	Graham Somerville
Bruce Bowen	Akira Hirata	Pacific Liaison &	Krishan Srivastava
Ross Keir Craigie	Donald A. Hoskins	Associates Inc	Marten Ternan
Patrick Daniel	Bent Jensen	George Percy	Gordon Thomson
Evans family—in memory	Thomas Johnston	Campbell Robinson	John Tiedje
of George E. Evans	Norman Lee	Estate of Charles	*Donors to the Clean Energy Research
Neil Fraser	Henry Man	Victor Ryder	Centre, forming one wing of the
Fyfe Development Ltd	Murray McAndrew	John A. Shaw	building, will be announced formally at
			its opening in the fall.

Ceremony held March 3rd, 2006

“Congratulations — this building embodies the ingenuity, perseverance and collaboration of a large and dynamic team,” said Dean Isaacson, Master of Ceremonies.

The Honourable Murray Coell, Minister of Advanced Education, Province of British Columbia; Dr. Martha Piper, President, The University of British Columbia; Mr. Dick Auchinleck (CHEM '76), Former-President and CEO, Gulf Canada Resources; and Mr. Graeme Young, President, Chemical and Biological Engineering Undergraduate Club joined Dean Isaacson in speaking at the opening ceremony.

“It has been a long and sometimes challenging road since this building was first conceived,” said Isaacson, “but the new Chemical and Biological Engineering Building is finally a reality.”

The building was first deemed a high-priority in the early 1980s when the university recognized the need for a new home for the Department of Chemical and Biological Engineering. The building allows the department, offering the only chemical and biological engineering degree programs in British Columbia, to consolidate its activities in a single, modern facility.

The 120,000 square foot building supports a complex variety of education and research activities — the latter broadly categorized as process research, environmental research and bio-processing research. It houses large-scale models of fluidized beds in high-head laboratories, specialized equip-

ment for monitoring the interfacial dynamics of complex fluids, cold rooms and incubator rooms to support delicate organisms and unique exhaust extraction facilities used in fuel cell research. Chemical and Biological Engineering graduates and research advance many sectors, including the oil and gas, pulp and paper, petrochemicals, polymers and plastics, inorganic chemicals and fertilizers, pollution control, biotechnology, bio-processing, and the chemical and biomedical industries.

To help provide the best education possible, the building was designed with state-of-the-art computer laboratories and lecture theatres and small-group design project spaces, as well as process, environmental and biological engineering laboratories with sophisticated equipment that students use.

The new Chemical and Biological Engineering Building, located at 2360 East Mall, immediately east of the Civil and Mechanical Engineering Building.

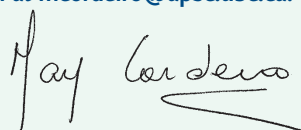


Alumni update

Welcome to 2006!

2005 was another exciting year of memorable reunions, receptions and other events involving alumni, faculty and students. The feedback from those of you who attended one or more of these events has been very positive and encouraging. UBC Alumni Affairs is also hosting receptions within and outside British Columbia, providing alumni an opportunity to meet the President and faculty members and learn about innovative research and infrastructure developments on campus. Within the Faculty we have had exciting developments, such as the opening of the Fred Kaiser Building (home to the Dean's Office and the Department of Electrical and Computer Engineering) and the new Chemical and Biological Engineering Building. This has been made possible in part because of the generous support we received from you, and for this we would like to say thank you. I would also like to take this opportunity to thank those of you who have volunteered your time participating in department lecture series, mentoring events and assisting as reunion organizers.

I am always looking for new ways to engage you in the growth and development of our Faculty and alumni relationship and would love to hear any suggestions you might have. As usual, should you decide to organize a class reunion, please do not hesitate to contact me by phone at 604-822-9454 or by email at mcordeiro@apsc.ubc.ca.



May Cordeiro
Alumni Relations Officer

2006 Event Highlights

CHML '65 — 40th Reunion — June 24 and 25, 2005

The Chemical Engineering class of 1965 and their guests celebrated their 40th reunion with weekend festivities that included an evening of cocktails and dinner, and a day of golf and a tour of the new Chemical and Biological Engineering Building. (no photo available)

CHML '80 — 25th Reunion — August 6, 2005

"The reunion of CHML '80 was great. We had people from Hong Kong, Korea, Saudi Arabia, the U.S. Virgin Islands, Calgary, Quesnel, Victoria and Vancouver," says reunion organizer Heather Herring. (no photo available)

CIVL '49 — 56th Reunion — September 7, 2005

The Civil Engineering class of 1949 (left) is a prime example of the great friendships built and developed over the years. This vibrant group meets every year to share stories and enjoy each other's company. This year's reunion was a lunch at the Qualicum Heritage Inn at Qualicum Beach followed by more fun at the home of classmate Bob Bagnall and his wife Bettie.



MECH '70 — 35th Reunion — September 23 and 24, 2005

Thanks to the enthusiasm of classmate and reunion coordinator Gordon Becker, this reunion was successfully attended by 37 grads and their guests. It included a morning of golf at the University Golf Club, drinks at the University Golf Club Pub, then cocktails and dinner at Thea's Lounge, UBC Graduate Centre. (no photo available)



Left: Some of the reunion attendees from Geology, Geological Engineering and Mining Engineering class of 1965 enjoy the party with a current student.

GEOE/MINE '65 — 40th Reunion — September 23 and 24, 2005

Graduates from the class of 1965 (above) from Geology, Geological Engineering and Mining Engineering joined forces to commemorate their milestone reunion. On the evening of September 23, attendees gathered at a reception at UBC's Geology Building followed by a student welcome barbecue hosted by mining students. Reunion attendees, students and Mining Engineering Head Malcolm Scoble enjoyed the opportunity to meet and chat. Reunion celebrations continued with a special dinner on September 24 at the UBC Graduate Centre. Thanks to Barry Price for putting this reunion together.

Right: BASC class of 1955 and guests at a lunch at Thea's Lounge, UBC Graduate Centre, Friday, September 29, 2005.



Right: BASC class of 1965 and guests at their 40th reunion reception held in the Faculty Lounge of the Civil and Mechanical Engineering Building on September 30, 2005.



GEOE '50 — 55th Reunion — September 30, 2005

In celebration of their 55th reunion, the Geological Engineering class of 1950 enjoyed lunch at Seasons Hill Top Bistro in Queen Elizabeth Park, Vancouver. More than one-third of the original class were present.

Left: Standing (from left): Lisle Jory, Stan Pedley, Chester Millar, Ken Harris, Atholl Sutherland Brown and Bob James.
Seated (from left): Bob Baragar, Roy Stuart, Ken Smith and Cliff Rennie.

EECE '50 — 55th Reunion — October 1, 2005

To celebrate their 55th reunion, 13 electrical engineering graduates of the class of 1950 and their spouses gathered at the home of Mr. and Mrs. Ken Parsons in North Vancouver. The reunion was blessed with a sunny afternoon and the location near Grouse Mountain provided excellent views of Vancouver harbour, the city and Point Grey. Besides an opportunity to rekindle friendships and catch up, the guests were treated by their hosts to wine, cheese and finger foods.

Electrical Engineering '50, like the majority of UBC's classes that year, was the largest graduating class to date, and engineers referred to it as Big 50. The electrical class consisted of about 10% recent high-school graduates and 90% WWII veterans. The veterans were a mixed bag — single men, married men and some with families. Thanks to reunion coordinator Mark Bradwell.



Below: Front row – Ken Parsons, Roy Cuthbert, Dan Lambert and Fred Mullen; centre row – Will Foster, Ken Allen, Jack Froud, Don West and Roy Ruddell; back row–Dick Abrahamson, Bill Newton, Mark Bradwell and Norm Kolbeins.



Left: BASC class of 1975 and guests at their 30th reunion held at Cecil Green Park House on October 1, 2005.

2006 Reunions

The following reunions are being planned for 2006: BASC '56, BASC '66, BASC '76, CHML '56, CHML '66, CIVL '66, CIVL '86, ELEC '56, ENPH '56, GEOE '86, MECH '81, MECH '95 and '96. Complete details on these events will be sent to the respective classes in the coming months and posted on www.apsc.ubc.ca/alumni/engg_reunions.

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

The following events are scheduled:

Class	Date	Events
CHML '66	Sept 9 & 10	Tour of department, cruise to Bowen Island and golf/brunch at Granville Island
CIVL '86	April 7 & 8	Pub night, golf and dinner
EECE '60-2000	TBA	Annual salmon BBQ
MECH '95-96	June 3	Tour of CEME Building and UBC, BBQ at the Cheez Factory and evening informal social
BASC '56	Sept 29 & 30	Lunch at the Graduate Student Centre, Sept 29. Reception and facility tours, Sept 30
BASC '66	Sept 30	Evening reception at the Faculty and Staff lounge in the CEME Building
BASC '76	Oct 1	Evening reception at the Faculty and Staff lounge in the CEME Building

Engineering undergraduates honoured

2005 Wesbrook Scholars announced

Each year UBC bestows its most prestigious award — Wesbrook Scholarships — upon a select number of undergraduate senior students with outstanding academics, who also participate in sports, leadership, and student and community activities.

Among these elite, one is selected to receive the university's most prestigious undergraduate award, the Sherwood Lett Memorial Scholarship. Two engineering students have been named 2005 Wesbrook Scholars, and one has also received the Sherwood Lett award.

Timothy John Blair, B.A.Sc. Engineering Physics, has received the 2005 Sherwood Lett award as well as a Wesbrook Scholarship.

Blair's appreciation and concern for the natural world drive his extracurricular activities and professional interests. He has served on the executive of UBC's Varsity Outdoor Club, instructing and organizing trips; volunteered for Scouts Canada and the Boys and Girls Clubs of Greater Vancouver; serves as secretary for the conservation section of the Vancouver Natural History Society, and has volunteered for UBC's Farm and Food Co-op. He is an avid cyclist, runner, cross-country skier,

mountaineer, kayaker and bird watcher.

Within the five-year Engineering Physics program, Blair has excelled in its demanding coursework, held leadership roles in the Engineering Physics Society and volunteered on outreach trips to help promote the program.

"Tim is an outstanding role model for current and future students," says Professor Bill McCutcheon, former Director of the Engineering Physics program. "With his intelligence, organization, leadership and genuine concern for others as well as the environment, Tim will contribute greatly to the field of engineering and to society."

After graduating this spring, Blair plans to work for Kerr Wood Leidal in Burnaby, doing stormwater infrastructure planning and modeling. He's interested in utilizing his engineering skills in stormwater management for the protection of fish habitat. He also foresees pursuing an advanced degree investigating the evolving influence of engineering computer models in the realm of public policy.

Hamidreza Ahmadian, a top Civil undergraduate, also received a 2005 Wesbrook Scholarship. He has donated his time and knowledge both locally and globally.

A member of the Golden Key International Honor Society and the Vancouver Board of Trade's Leaders of Tomorrow team, Ahmadian has served as a curriculum representative for the Civil Engineering Club and tutors undergraduate students in math and physics. He volunteers for Junior Achievement of British Columbia, and has also volunteered extensively in fundraising efforts for the reconstruction of Bam, Iran after the devastating 2003 earthquake. His sporting interests include competitive Judo, snowboarding, tennis, soccer and swimming.

"Hamidreza has contributed much to the department and to his community," says Eric Hall, Civil Engineering Department Head. "He has chosen to pursue civil engineering with the ultimate goal of improving society, and his future is very bright."

After graduation, Ahmadian plans to become a Professional Engineer and explore the world of construction. Eventually he's interested in furthering his education and becoming more active in the community — he feels declining social capital is a problem in many societies and it can only be overcome by an individual's civic engagement.



Tim Blair, ENGP '06, Sherwood Lett and Wesbrook Scholar.



Hamid Ahmadian, CIVL '06, Wesbrook Scholar.

Twenty Wesbrook Scholarships, each including \$1,000, were awarded this year from a record number of 75 applicants. The Sherwood Lett is an additional \$7,500 award. Recipients must be nominated by their Faculty, department or a designated student organization.

Retirements

The Faculty would like to acknowledge with sincere appreciation the following faculty members for their many years of service. Each retired December 31, 2005:

Ian G. Cumming, Electrical and Computer Engineering



Ian Cumming received his B.A.Sc. in Engineering Physics from the University of Toronto in 1961, and his Ph.D. from Imperial College, University of London in 1967, where he remained for three years as a Senior Research Engineer. In 1971 he joined Computing Devices of Canada in Ottawa, working on sonar signal processing for six years.

He then joined MacDonald, Dettwiler & Associates (MDA) in 1977, doing research on synthetic aperture radar (SAR) signal processing algorithms, which led to his promotion to Principal Engineer in 1983.

In 1993, MDA and NSERC sponsored his appointment to UBC, where he held the NSERC/MDA Industrial Research Chair in Radar Remote Sensing.

Cumming is considered by many to be one of the pre-eminent experts in SAR research throughout the world. He was a senior member of a team that built the first digital SAR processor in the late 70's and has continued to have a significant impact on research and development. Almost every satellite ground station uses radar signal processing algorithms that he helped to develop. He holds two patents and recently co-authored the highly anticipated book *Digital Processing of Synthetic Aperture Radar Data*.

Now that he is retired, Cumming looks forward to exploring his interests in hiking, skiing, traveling and wildflower photography. He continues to be active in his profession, working with the Canadian Space Agency, consulting and pursuing research leads from his book.

Richard Kerekes, Chemical and Biological Engineering



Richard Kerekes obtained his B.A.Sc. and M.A.Sc. in Mechanical Engineering from the University of Toronto and his Ph.D. in Chemical Engineering from McGill University in 1970. He joined the Pulp and Paper Research Institute of Canada (Paprican) in 1971, where he held positions of increasing responsibility over 30 years. He came to UBC in 1978 as an

Honorary Professor in the Department of Chemical and Biological Engineering to develop a collaborative post-graduate program between Paprican and UBC. In 2001 he joined the Faculty holding the Paprican Professorship in Pulp and Paper Engineering.

A world-renowned expert in pulp and paper engineering, Kerekes has had a tremendous impact on industry through his scientific accomplishments. He has received numerous professional honours, including the prestigious John S. Bates Memorial Gold Medal—the highest technical award given by the Canadian pulp and paper industry. Kerekes has also made outstanding contributions to UBC. He is the founding Director of UBC's Pulp and Paper Centre and led many initiatives during his 23 years as Director, including the Pulp and Paper M.Eng program and the Advanced Papermaking Initiative. Under his direction, the Centre has become a premier resource for pulp and paper research.

Most days he can be found in the centre working on research and administration as Director of PAPIER, an organization of Canadian academics involved in research for the paper industry. He is also finding time to pursue his favourite hobby—reading history.

Sidney Mindess, Civil Engineering

Sidney Mindess received a B.A. and a B.Sc. in Civil Engineering from the University of Manitoba in 1964 and 1965, respectively; and received his M.S. and Ph.D. in Civil Engineering from Stanford University in 1966 and 1970. He joined the Department of Civil Engineering in 1969.

For the past 37 years, Mindess has contributed extensively to the understanding of materials and their structural applications. He has led a number of modern developments in the application of fibre reinforced concrete and done pioneering work on the impact behaviour of concrete. He has co-authored four widely referenced books: *Concrete; Fibre Reinforced Cementitious Materials; The Science and Technology of Civil Engineering Materials; and Aggregates in Concrete*. He is a Fellow of the American Ceramic Society, the American Concrete Institute, RILEM (a not for profit, non-governmental technical association) and the Canadian Society of Civil Engineering. He was recently honoured for his lifetime achievements by a special symposium at the 2005 International ConMat Conference.

Mindess has also contributed through a number of important administrative roles including Associate Dean, Applied Science; Associate Vice President Academic, UBC; and President, UBC Faculty Association. Among his many accomplishments are the development of annual seminars for science teachers and for female secondary-school students considering careers in engineering and an access program for First Nations students interested in engineering, forestry or agricultural sciences.

He can often be found in his office, working with his graduate students, though he hopes to find more time soon for travel through the wine regions of France.



Donna Shultz, Technical Communication Centre

In 1989, upon completing her B.A. and M.A. degrees in English (Language/Rhetoric) at UBC, Donna Shultz joined the Department of English as a Sessional Lecturer, teaching composition, literature and technical writing courses. In 1993, she was appointed Instructor 1 and APSC 201 Coordinator within the Faculty of Applied Science, responsible for developing the new technical communication course in second-year engineering.

A dedicated teacher and administrator, Shultz took her mandate to improve the communication skills of engineering students seriously—from coordinating that single course to developing and directing a vibrant and successful Technical Communication Centre, launched in April 2003. Through her role as Director, she oversaw seven faculty members teaching APSC 201. She also made significant enhancements, such as facilitating faculty collaborations within engineering; integrating writing and presentation skills with the technical content in course assignments; addressing engineering classes about assignment expectations and strategies;

providing feedback on oral and written work; and organizing workshops for undergraduates on topics such as writing lab reports and for graduate students on improving English language skills and marking assignments.

Shultz's vision and leadership abilities have contributed extensively to the communication and career development initiatives within the Faculty. Now she looks forward to working in the family consulting firm, Clayton Shultz and Associates, Inc., responsible for—what else—vetting and editing the arbitration, valuation and other financial reports that comprise the firm's product.



Celebrating a record number of placements

Engineering Co-op strives to add value

During 2005-06, more than 1,148 Engineering Co-op students have secured work terms, the highest number of placements in the history of the program.

Committed to providing meaningful opportunities for integration of work and learning, Engineering Co-op strives to offer the most value for its students, industry and university partners.

The Director meets regularly with the Engineering Co-op Student Advisory Council and also attends departmental industry advisory committees to assist in evaluating services and establishing strategic goals.

Co-op has prioritized several new initiatives for 2006 including fostering alumni relationships, increasing the number of international opportunities, creating a position at UBC Okanagan and improving its office space.

To best serve Engineering Co-op alumni and students from all engineering disciplines, the office, directed by Jenny Kagetsu, divides work placements by engineering program.

The program Coordinators include: Sheenagh Brooks, Civil and Geological; Noreen Kamal, Chemical and Biological, Materials, Mining and Environmental; Nicole Benda, Electrical and Computer, Master of Software Systems; Dana Stephenson, Electrical and Computer, Master of Software Systems; and Sherrie Myers, Mechanical and Integrated. (Jackie Copland, Mechanical and Integrated, is on maternity leave.)

Assisting the Coordinators and helping the office to run smoothly are Wendy Lock, Erika Annala and Jackie Niddrie.

The group is currently enhancing communications and developing events to foster relationships with Engineering Co-op alumni and students. In response to requests for closer contact to the program, they have recently launched *Reconnect @ Network*, a newsletter emailed to more than 2,000 Engineering Co-op alumni. The newsletter is also available to current students interested in learning about the careers of program graduates. To view the inaugural issue and learn about upcoming events, please visit:
http://www.coop.apsc.ubc.ca/alumni_newsletter/home.php

Supporting its mission to offer the most value to students, industry and university partners, Engineering Co-op is working to increase the number of international placements.



The Engineering Co-op staff, from top left: Coordinator Nicole Benda, Erika Annala, Wendy Lock, Coordinator Sheenagh Brooks, Coordinator Noreen Kamal, Jackie Niddrie. Bottom from left: Coordinator Dana Stephenson, Director Jenny Kagetsu and Coordinator Sherrie Myers.

“We hear time and again from our students that working abroad has been the single most outstanding experience of their university careers,” says Kagetsu. “In terms of personal and professional growth, an international work-term is tremendous.”

Not only are international placements of great value to students, but such placements also benefit industry by providing engineers with broad perspectives and experience. This also helps UBC adhere to its Trek 2010 goal of educating global citizens and the Faculty’s mission of educating outstanding engineers. Of the 1,148 Engineering Co-op placements made this academic year, nine per cent were international — the program’s long term goal is 15 per cent.

Co-op plans to provide UBC Okanagan engineering students with international as well as domestic opportunities like their Vancouver counterparts. A position has recently been created for an Engineering Co-op Coordinator at the Kelowna campus, dedicated to the needs of students and industry in that location.

In order to serve students and industry in the most professional manner, Engineering Co-op’s facility will soon be renovated, and it will occupy the entire Engineering Annex Building. The new space will allow for a professional reception area, a dedicated private interview room and a presentation room.

UBC Engineering Co-op is the largest co-operative education program on campus and the largest engineering co-op program in British Columbia. This year, 74 per cent of UBC engineering undergraduate students entered the Co-op program during second-year, and this year’s graduating class earned an average of \$46,576 during the last of five co-op terms.

Tribute to Professor Parkinson

Founder of Mechanical Engineering Wind Tunnel

By Professor Ian Gartshore

With the appointment of Geoff Parkinson as a faculty member in 1951, the Department of Mechanical Engineering deliberately added academic research as one of its prime departmental objectives. Geoff's own graduate studies were entirely in theoretical aerodynamics and mathematics, and these remained the passions of his academic life. But immediately upon coming to UBC as a faculty member, Geoff started on the design and construction of a wind tunnel.

Throughout his career, Geoff used this tunnel, not only for research, but also to show his often awestruck students how precisely his theories of aerodynamics applied in practice. His wind tunnel is still in constant use in the department, some 50 years after it was built, and is named the Parkinson Wind Tunnel.

It was Geoff's teaching that first aroused my interest in fluid mechanics, and I

was completely converted when, as a summer student in 1956, I worked for Geoff on the design and construction of the wind tunnel. Geoff was a splendid teacher, both in and out of the classroom. His passion for his subject, his sense of humour and his love of good conversation (and music, food and martinis!) quickly sparkled out to all who broke through his shy, but occasionally intimidating, exterior.

Geoff played a remarkable game of tennis, placing well in city tournaments in his early years and, despite the addition of a few extra pounds in later years, soundly trouncing many of us who were decades his junior. Golf too was a game which Geoff enjoyed immensely and intensely throughout his life.

As a brilliant academic and a wise colleague, Geoff left his mark on the department he served so well for some 38 years. Geoff's intellectual rigor,



Professor Geoffrey Parkinson circa 1972.

his wisdom and his friendship have added immensely to the lives of those who were fortunate enough to know him.

Geoffrey Parkinson, 1924–2005. “We shall not look upon his like again.”

Although Professor Parkinson officially retired in 1989, his legacy will continue for years to come. As a way to honour his contributions to the department, fluid mechanics and aerodynamics, a memor-

ial fund has been created to assist future mechanical engineering students. Tax receipts are available for donations sent to:

The Geoff Parkinson Memorial Fund

c/o Michelle Messenger-Orr,
UBC
500-5950 University Blvd,
Vancouver BC V6T 1Z3,
Canada
Phone: 604-822-8904
Fax: 604-822-8151
Email: michelle.orr@ubc.ca

Appointments

Electrical and Computer Engineering

Tor Aamodt was appointed Assistant Professor on January 1. His research expertise is in the area of computer architecture with an emphasis on memory system microarchitecture for high performance microprocessors.

Karen Cheung was appointed Assistant Professor on January 1. She is an expert in biomedical microsystems for diagnostic and therapeutic applications: dielectric spectroscopy for flow cytometry; implantable polymer-based microelectrode arrays; and integrated cell culture systems.

Edmund Cretu was appointed Assistant Professor on January 1. His research interests are in MEMS/microsystems and nonlinear signal processing, with emphasis on adaptive and functional coupling in microsystems for biomedical applications.

Matei Ripeanu was appointed Assistant Professor on January 1. His research focuses on large-scale distributed systems (grid, peer-to-peer and utility computing) and high-performance computing.

Achievements

Chemical and Biological Engineering Professor **David Wilkinson** has been elected a Fellow of the Engineering Institute of Canada.

Civil Engineering Professor **Perry Adebar** has been elected a Fellow of the American Concrete Institute.

Civil Engineering Associate Professor **Helmut Prion** has been elected a Fellow of the Canadian Society for Civil Engineering.

Electrical and Computer Engineering Professor Emeritus **Michael Davies** has been elected a Fellow of the Engineering Institute of Canada.

Electrical and Computer Engineering Professor Emeritus **M. Robert Ito** has been elected President of the Association of Professional Engineers and Geoscientists of B.C. for 2006-07.

Electrical and Computer Engineering Senior Instructor **Luis Linares** has been awarded a UBC Killam Teaching Prize.

Electrical and Computer Engineering Assistant Professor **Z. Jane Wang** has received (along with co-authors W. Trappe, M. Wu and K.J.R. Liu) the Best Paper Award from the IEEE Signal Processing Society for a paper of exceptional merit published in the past three years.

Mechanical Engineering Professor **Yusuf Altintas** has been elected a Fellow of the Society of Manufacturing Engineers.

Mechanical Engineering Instructor **Jon Mikkelsen** has been awarded the 2005 Wighton Fellowship jointly from the Sandford Fleming Foundation and the National Council of Deans of Engineering and Applied Science.

Mechanical Engineering Associate Professor **Carl Ollivier-Gooch** has been awarded a UBC Killam Teaching Prize.



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The Faculty's engineering activities include the following:

Departments, Schools 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
- UBC Okanagan School of 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
- NUS-UBC Applied Science Research Centre
- Pulp and Paper Centre

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innovative curriculum awarded

The Department of Mechanical Engineering has recently been selected to receive the American Society of Mechanical Engineers (ASME) 2005 Curriculum Innovation Award for "Mech 2: A Fully Integrated Second-Year Mechanical Engineering Curriculum."

The award will be presented on April 2nd, 2006 at the International Mechanical Engineering Education Conference in Beijing, China. Since the award's inception in 1993, this is the first time a

Canadian university has received this prestigious award.

The Mech 2 program (featured in *Ingenuity* spring/summer 2005) was carefully designed to develop Mechanical Engineering students' analytical, practical and design skills with the goal of immediately applying knowledge and skills to practical engineering problems.

In contrast to the traditional curriculum that offers disparate classes each term, Mech 2 students take one integrative course at a time, designed to synthesize

instruction in mathematics, engineering materials, electronics, mechanical engineering sciences, engineering design and technical communication.

"In the traditional program, students juggled five or six diverse courses and had difficulty seeing connections in the material," says Peter Ostafichuk, Mech 2 Program Coordinator. "In Mech 2 students take only one carefully designed course at a time and the material is presented in a logical, integrated fashion."