The EXCHANGER

Chemical and Biological Engineering Spring 2012

Tapping into CHBE Expertise

UBC researchers think small to improve access to safe drinking water in rural communities

Clean Energy Research Centre

Committed to clean and sustainable energy

a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

Message from the Head

Welcome to *The Exchanger*, our department's newsletter. The newsletter's name was suggested by one of our students through a competition that was held in the department. One may readily relate it to chemical and biological engineering. The department is also a place where debate and exchange of ideas takes place. We hope that this newsletter will serve as a conduit for the exchange of news and stories that connect us with friends of the department and our alumni.

In the inaugural issue of The Exchanger you will read about our research on clean energy and on our efforts to provide clean water to small communities in Canada. Community Service Learning is a new and exciting activity in our department. Through engagement with community our students are applying the fundamentals of chemical and biological engineering to serve the community. Several projects that address and solve real and immediate challenges are integrated into our courses. We are proud to celebrate our faculty and students achievements, which you will have the opportunity to read in this issue. We also enjoyed hosting the reunion of the Chemical Engineering class of '61 in August.

Last year 49 students graduated with a BASc degree in Chemical Engineering and 22 with a BASc degree in Chemical and Biological Engineering. In addition, nine students received their PhD, eight a MASc, one an MSc and ten their MEng degree. We warmly congratulate these students and wish them well in their careers.

Professor Sheldon Duff retired on August 31, 2011 after serving the department for almost 20 years. Sheldon was an outstanding member of the department. He helped found the UBC/UNBC Environmental Engineering Program and did research in Environmental Engineering and Clean Energy. We congratulate Sheldon on his retirement and extend our best wishes for a happy and healthy future.

We hope that you will enjoy reading The Exchanger. We look forward to hearing from you and we will be happy to see you visiting our department.

Peter Englezos
Head

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EDITOR
Fariborz Taghipour

CONTRIBUTING WRITERS
Xiaotao Bi
Peter Englezos
John Grace
Ronald Greene
Anna Jamroz
Paul Kim
Ezra Kwok
Madjid Mohseni
Royann Petrell
Norman Siu
David Wilkinson

EDITORIAL & GRAPHIC
Anna Jamroz
Wendy McHardy

PRODUCTION
Minuteman Press

MAILING ADDRESS
Department of Chemical and Biological Engineering
2360 East Mall
Vancouver, BC V6T 1Z3

UPDATE YOUR ADDRESS
Online:
www.alumni.ubc.ca/contact/address.php
Email: alumni.records@ubc.ca
Phone: 604.822.8335

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Shining UV and activating fluidized photocatalyst particles for water treatment.

Photo by Martin Dee.

From Chemical & Biological Engineering to Biomedical Engineering

Dr. Ezra Kwok during one of his surgical missions.

An interdisciplinary approach to solving real-world problems is a central attribute of the Biomedical Engineering Program - a program established in 2006 by Professor Ezra Kwok for the Faculty of Applied Science. Biomedical Engineering is the application of engineering techniques and technologies to medical and healthcare problems. This specialty program at UBC has grown from a few students to over 50 graduate students within the past few years. One of Dr. Kwok's goals is to create better engineering-based solutions for improving the quality and delivery of our healthcare. He knows well the benefits of the clinical environment first-hand. An engineering professor in our department since 1995, Dr. Kwok took a leave of absence in 2001 to pursue an MD at McMaster University. When he returned to UBC in 2004, he finished his family medicine residency training and helped create the program as the inaugural Program Director.

Although having stepped down from the directorship in 2010, Dr. Kwok continues his teaching and research in biomedical engineering. One could consider his work an extension of chemical and biological engineering because it encompasses some fundamental components of traditional chemical engineering. He has been a pioneer in the development of a Type II diabetic model for the assessment of patient conditions. The model is based on classic chemical engineering principles. The results are applicable to patients who require optimizations of their treatment strategies including blood glucose control with insulin injections. Another research area is his development of a laser-based glucose sensor that is small enough to be implanted in a blood vessel and accurate enough to measure blood glucose in the physiological range. In the summer of 2011 at the 5th World Congress on Bioengineering, an award-winning paper on the Clinical Modeling of Urinary Stress Incontinence was presented by Dr. Kwok's graduate student Clare Yip. For the first-time in biomechanics, research work has shown conclusively using a biomechanical model and human data that the correction of pelvic floor muscle to reduce the symptoms of female urinary stress incontinence can be achieved by simple pelvic floor muscle exercise.

Dr. Kwok continues with on-going research in several other clinical areas such as synovial fluid properties for osteoporosis, prosthetic device assessment for amputees, and optimization for pharmaceutical design. Because of his many contributions in biomedical engineering, he was named the Outstanding Canadian Biomedical Engineer in 2011 by the Canadian Medical and Biological Engineering Society. This award is based on achievements in the field of biomedical engineering in the form of scientific or technical developments as well as a broad-spectrum of areas such as leadership, services and organizational skills that contribute to the improvement of health care delivery nationally and internationally.

Besides being a professor in Chemical and Biological Engineering, Dr. Kwok continues his practice and teaching in Family Medicine. He is also an active member of overseas surgical missions bringing hope to patients who cannot afford to see a doctor. One of his personal goals as a global citizen, in addition to his research and teaching, is to improve the quality and delivery of healthcare to those most in need.

Clean Energy Research Centre - Committed to clean and sustainable energy

Clean Energy Research Centre's Fuel Cell Lab

Energy remains one of the biggest challenges for the 21st century. It lies at the nexus of water, health, food, and other issues. Some of the key challenges include resource sustainability, particularly for oil and gas, environmental damage and climate change, reduced affluence and urgency. To quote Richard Smalley (1996 Nobel Prize winner in Chemistry) "Energy is the single most important challenge facing humanity today. Somehow we must find energy prosperity for the 21st century...." These global challenges are also opportunities for UBC and the Clean Energy Research Centre (CERC).

Over the last four years faculty growth at CERC has increased from 20 to over 65 faculty members, with additional associate members external to the university. Faculty involvement is very interdisciplinary, primarily involving different Applied Science departments but also Science and Forestry, and others. The Department of Chemical and Biological Engineering is one of the largest members of CERC, an indication of the importance of this discipline in clean energy. CERC members are doing research in areas such as energy efficiency, energy generation, energy storage and energy management. Over the last couple of years the University has established a "Living Lab" program to implement newer energy technologies at scale that not only help to meet operational requirements but also to provide opportunities for education and faculty research. CERC is an important part of this new initiative and will play an increasing role going forward.

In 2009 CERC launched a Masters of Engineering in Clean Energy program with a yearly enrollment of about 25 students. This program is in its third year and has been hugely successful with over 80% of the graduates being employed in the energy sector. BC Hydro PowerSmart® has been an important sponsor and an integral part of the program. Over the last two years there has also been significant outreach and collaborative activities with the provincial government and the industrial energy sector. This has included a CERC summit event in 2011 (Collaborating for Sustainable Clean Energy) with over 230 participants, and targeted workshops in areas such as CO_2 mitigation , bio-energy, the oil sands, and hydrogen and fuel cells. This has been an important activity in identifying future funding and collaborative opportunities with large energy cluster areas. On the home front CERC continues to have an active seminar program, newsletters, and an annual internal open house.

In the Fall of 2010 CERC established a very active and committed advisory board consisting of university and industry leaders (Chair: Eamonn Percy, Former President and COO of Powertech). This board is integral to CERC moving forward, identifying opportunities in the energy sector, and dealing with such issues as operational sustainability for CERC. The future looks very bright for CERC, and Applied Science Departments such as Chemical and Biological Engineering will play a pivotal role.

Class of 1961, along with Dr. Jim Lim (far left) and Dr. Peter Englezos (second from the right).

Class of 1961

Chemical Engineering Returns to UBC to Celebrate 50th Anniversary

By Ronald Greene

Plans for the reunion started in July 2010 when my wife and I visited Bent Jensen in Brussels when we broke our trip on the way to a South African safari vacation. He asked me if there were any plans for a 50th reunion of our class – it turns out that if we wanted a reunion, then it was up to us! Since we thought that Bent had the farthest to come and was going to be in Canada in August we picked the dates of August 18th and 19th. Only much later, when we finally found Paul Dickie living in New Zealand did we realize that we had two classmates in opposite corners of the world. Unfortunately, Paul was giving a presentation in Manila on the 19th and would miss the reunion. Our class had 17 graduates in 1961. Of these, Dennis Burningham had passed away in July 2010, the first to die of natural causes, and Robin Clarke had died in an automobile accident in September 1982. We also invited Ken Fernie, Class of 1962, who had spent the first three years with us. Of the 16 surviving members, 13 indicated a willingness and availability to attend. Unfortunately, three of these encountered medical issues which in the end precluded their attendance.

We settled on a dinner on Thursday August 18th at the Fish House in Stanley Park which had been recommended to us by a friend living in Vancouver. We were able to check it out in June when Bob and Bonnie Zalkowitz were passing through Vancouver, and agreed that the menu and setting would be fine. It had a relatively private area where a bunch of rowdy engineers wouldn't disturb the other patrons. It had the advantage that it was also a short walk from the Sylvia Hotel in case anyone wished to have an extra glass of wine and not have to drive. On the appointed night of dinner, it was a lively affair, from the first look at classmates we may not have seen in 50 years – some we recognized immediately, others took a moment before we could realize who they were. A pre-dinner reception allowed us to chat with many others and their wives, then dinner, with as few formalities as we could get away with. Catching up for 50 years took a lot talk. It was a very enjoyable evening.

On the following morning we met in a classroom in the Chemical and Biological Engineering building and were welcomed warmly and given updates on the department by Shantal Cashman, Development and Alumni Relations, and the Head of the Department, Dr. Peter Englezos. We enjoyed a tour of the facilities and were very impressed, any one of the larger labs was probably larger than the entire space in our student days at "The Pit". We also discovered that there are more graduate students today than our entire class. We met a number of the faculty and lab instructors who were very engaging and explained what went on in the labs.

Dr. Jim Lim giving the Class of 1961 a tour of the current facilities.

At Sage Bistro (the former Faculty Club) we met Dr. Epstein and were joined by Dr. Englezos, Dr. Lim and Shantal Cashman for lunch. Several of the wives had made their own tour of the campus and joined us for the lunch as well. It was great to see and speak with Dr. Epstein after all these years. After lunch we all dispersed and headed home or continued on our travels. Most of the comments ran to the effect of, "why did we wait so long to have a reunion?"

Norman Epstein Reaches 60 Year Milestone at UBC

Norman Epstein joined the UBC Chemical Engineering Department in the summer of 1951 and has been a mainstay ever since. In recognition of his many contributions, the department held a special celebration on November 16, 2011 at which colleagues, friends, associates and students paid tribute to Professor Epstein for his 60 years as a key and cherished member of the department. This event followed a tribute dinner for him at the Canadian Chemical Engineering Conference in London, Ontario in October.

Norman was born in Montreal in 1923 and grew up there, attending McGill University for both his B.Eng. and M.Eng. degrees. His Master's thesis, completed in 1946, was entitled "Nonisothermal friction loss for a gas." He next attended New York University, supervised by Prof. John Happel, completing a Ph.D. thesis entitled "Flow through assemblages of spheres." He was appointed an Instructor at UBC in 1951, promoted to Assistant Professor in 1954, to Associate Professor in 1958 and Full Professor in 1965. Over the years, he taught many courses, including Introduction to Chemical Engineering, Technology & Society, Mass Transfer, Heat Transfer, and Particulate & Multiphase Systems. Among his duties while a faculty member at UBC, he served as Advisor to the CSChE/AIChE Student Chapter, Graduate Advisor, member of the UBC Senate, and member of the Faculty Association Grievance Committee. Outside service included being

Celebration of Dr. Epstein's accomplishments during the CSChE Conference in London, Ontario.

a member of the Association of Professional Engineers Board of Examiners, the NRC Grant Selection Committee in Chemical & Metallurgical Engineering, President of the Canadian Society for Chemical Engineering (CSChE), Chair of Intersociety Relations for the CSChE, Chair of the Canadian National Committee on Heat Transfer, Chair of

Dr. Norman Epstien.

two International Symposia on Spouted Beds, Editor of the Canadian Journal of Chemical Engineering, member of the NSERC Grant Selection Committee on Publications, and Chair of a very successful Gas-liquid/Gas-liquid-solid Conference. Norman formally retired in 1989. As an Emeritus and Honorary Professor since then, he has continued to come to his office daily and to serve on many thesis committees, and as a much-loved informal mentor and advisor.

In his research, Norman has done internationally leading work on Sedimentation, Classification, Drag, Electrokinetic flow, Colloidal deposition, Fouling heat transfer, Spouted beds, Liquid-fluidization, and Three-phase fluidization. He has supervised many graduate students and post-doctoral fellows, including, among many others, Jacob Masliyah, Bruce Bowen, Cam Robinson, Graham Neale, Barry Pruden and Jim Lim. Among his many honours have been a Killam Research Fellowship, the R.S. Jane Award of the CSChE, the Jules Stachiewicz Heat Transfer Award, the Fluor Daniel Lectureship Award of the American Institute of Chemical Engineers, and a CSChE Century of Achievement Award. He is an Honorary Fellow of the Chemical Institute of Canada, a Fellow of the Canadian Academy of Engineering and of the American Institute of Chemical Engineers. When the department opened it new building in 2006, one of the major facilities in the building was dedicated as the Norman Epstein Reading Room.

In addition to his many work-related contributions and professional honours, Norman is appreciated for his self-effacing humanity, commitment to social justice and international peace, and his rigour. His many interests include films, singing, politics and philosophy. The department salutes Norman Epstein and hopes that he will continue to honour us with his presence for many years to come.

Tapping into CHBE expertise

UBC researchers think small to improve access to safe drinking water in rural communities

Canadian culture is steeped in water. Eight of the world's 20 largest fresh water lakes lie within our borders, as do nearly 50 rivers that each stretch 600 kilometres or more – to say nothing of our 200,000 kilometres of coastline.

Although less than 1% of all the Earth's water is accessible and appropriate for human consumption, we've nonetheless grown accustomed to the idea that clean drinking water is only as far away as the nearest tap.

That is, unless you live in a small, rural or First Nations community (SRC), a shocking number of which struggle to provide drinkable water on a regular basis.

Left: PhD student Clara Duca and Dr. Mohseni discussing an on-going experiment. Right: Analysis of algal toxin Microcystine LR in water after undergoing treatment.

Enter RES'EAU WaterNET, Canada's first and only multidisciplinary research network devoted exclusively to developing innovative, affordable technologies for providing clean drinking water to SRCs. Funded by Natural Sciences and Engineering Research Council (NSERC) in partnership with UBC, RES'EAU unites the efforts of 14 senior researchers at seven universities across Canada, along with a broad network of collaborators in government and industry.

Several UBC investigators bring their unique expertise to the RES'EAU team, including Dr. David Wilkinson, CHBE Professor and Tier 1 Canada Research Chair in clean energy and fuel cells, Dr. Elod Gyenge, a CHBE Associate Professor and expert in electrochemical power sources, and Dr. Madjid Mohseni, CHBE Professor of chemical engineering and RES'EAU's Scientific Director. Dr. Pierre Bérubé of UBC's Department of Civil Engineering and Dr. Rehan Sadiq, a civil engineer and Associate Professor at UBC Okanagan, also lead network research projects. Almost 90 highly qualified personnel – from undergrads to post-doctoral fellows – have also been involved in the RES'EAU program, gaining unique experience by working closely with both research teams and the communities who stand to gain from their efforts.

Together, their goal is to accelerate the development and implementation of water purification technologies and processes that overcome the unique cultural, political, economic and technical obstacles SRCs face.

The stakes are high.

"Most Canadians would be alarmed at how pervasive contaminated drinking water is among SRCs," says Dr. Mohseni. "When it makes headlines, such as when seven people died in Walkerton, ON in 2000 from E.coli contamination, people take notice. But the reality is that hundreds of communities and thousands of Canadians live with potentially unsafe water every day, in conditions that sometimes mirror those in the developing world. It's an ongoing public health catastrophe, and one which urgently requires a collective effort to address."

Most research and development in water purification is aimed at larger municipalities that can support costly infrastructure while tapping into larger pools of skilled operators, Dr. Mohseni adds. Not so for the majority of SRCs, which often lack the funds to update and operate new technologies.

From lab bench to the local tap, RES'EAU engages water technology engineers, scientists, economists, science policy experts and community end-users in a process that rethinks and refines alternative models for innovation to produce robust and affordable solutions for SRCs. The network's research program includes 15 projects conducted under three broad themes: Characterizing Source Water Quality, Development of Innovative Treatment Solutions, and Diffusion of Innovative Solutions.

"Our unique approach puts the needs of Canada's small communities first," Dr. Mohseni concludes. "Being able to tap into the expertise and cutting-edge technologies at UBC/CHBE has allowed us to make significant progress towards our goal of providing safe drinking water to all Canadians."

For more information on RES'EAU WaterNET, visit www.reseauwaternet.ca.

New Director of UBC's Advanced Papermaking Initiative

Professor Mark Martinez is the new Director of UBC's Advanced Papermaking Initiative.

The highly successful Advanced Papermaking Initiative's (API's) mission has been to enhance the competitiveness of our Provincial industry through leading-edge research, technology development and advanced training. Professor Mark Martinez takes over as Director of the API from Professor Peter Englezos who lead the initiative over the last five years. Dr. Martinez is a Professor in the Department of Chemical and Biological Engineering. He won the BCIC Lieutenant Governor's Award for Innovation in 2008, as well as an NSERC Synergy award in 2007 with Canfor and Advanced Fibre Technologies Inc. His research activities focus on the behaviour of papermaking fibre suspensions which exhibit complex behaviour not seen in ordinary fluids with applications to paper forming, pressing and advanced equipment design. Dr. Martinez uses both novel visualization techniques, such as positron emission tomography (PET) and pulsed ultrasound Doppler anemometry, and computational fluid dynamics to elucidate the mechanism by which these suspensions flow. Dr. Martinez is a member of the Institute of Applied Mathematics, a faculty associate of the UBC Pulp and Paper Centre and a member of the Pulp and Paper Technical Association of Canada. He has active collaborations with researchers in Mechanical Engineering, Mathematics and TRIUMF.

Professor Sheldon Duff, "Environmental Guy" retires

Professor Sheldon J.B. Duff retired from the Department of Chemical and Biological Engineering in August 2011, after 19 years at UBC. He leaves a legacy of dedication to his students, commitment to administrative programs and the joint-degree program he helped found.

After finishing his PhD at McGill University, Duff worked at the National Research Council in Ottawa and at Canada's Department of Energy, Mines and Resources before coming to UBC in 1992.

Duff co-designed the UNBC/UBC Environmental Engineering program in 2002. The joint program was created to meet a demand for engineering specialists in the growing environmental industry and to facilitate the introduction of an engineering program at the University of Northern British Columbia.

"I was at the initial meeting because I was the 'environmental guy' in CHBE," says Duff. "UBC Civil Engineering Professor Greg Lawrence and I designed the program and became the first UBC co-directors."

Duff continued as co-director until 2010. He also developed and implemented new undergraduate courses and Environmental and Biotechnology options for UBC's undergraduate Chemical Engineering curriculum.

Duff published extensively in the area of biofuels, with interests ranging from environmental design to the environmental impact of industrial effluents and biotechnology. His research often led to consultations with industry, such as Tembec and Noram Engineering and Constructors.

His parting advice to newer colleagues: "Devote a significant amount of effort toward undergraduate [in addition to graduate] education." He also recommends getting involved in administrative work, because it is "critically important to a well-run university."

Reprinted with permission from Ingenuity Spring/ Summer 2011

Dr. Les Shemilt (1919-2011)

Dr. Les Shemilt passed away on December 20, 2011, five days short of his 92nd birthday. Les was one of the stalwarts of the CHBE Department in its early years including a stint as Acting Head. Les joined the Chemical Engineering Program at UBC in 1947. He developed the first undergraduate course in automatic control in any Canadian chemical engineering program. Together with Don Scott and Norman Epstein, he led the effort to convince the University to establish the Department of Chemical Engineering in 1954 within the Faculty of Applied Science. Les served as Executive Officer for 1954 - 55, then as Acting Head until the first Head, J. S. Forsyth was appointed in 1957. Les and Stu Cavers were instrumental in securing the first Chemical Engineering building on Campus. The building was occupied in 1961 and served until 2006. Les resigned in December 1960 to go to the University of New Brunswick as the founding Chemical Engineering Department Head. In 1969 he joined McMaster University as Dean of Engineering. Les always retained a strong connection with our department even though he went on to be a faculty member and Dean at two other Canadian Universities. Our condolences go out to his family and friends.

Scholarships Established in Memory of Professor Chad Bennington

Two scholarships of $1000 each have been established in memory of Prof. Chad Bennington, who passed away suddenly in February 2010. The scholarships will be funded by an endowment raised from contributions by many of Dr. Bennington's friends and colleagues, as well as the Department of Chemical and Biological Engineering and the Faculty of Applied Science.

In recognition of Dr. Bennington's strong commitment to the pulp and paper industry, the scholarships will be awarded to undergraduate students in Chemical and Biological Engineering who demonstrate interest, leadership, and academic accomplishment in pulp and paper related technologies. The awards will be made on recommendation of the Scholarships and Prizes Committee of the Department of Chemical and Biological Engineering. The first awards will be presented in the Winter of 2012.

Students touring Domtar's mill in Kamloops. Students from left to right: Erfan Bhuiyan, Bryan Chen, Norman Siu, Jim Shen, Richard Xia, Victor Ma, Norvin Ng

Third-Year Student Field Trip

For the first time, the weeklong annual, third-year field trip was held in September. Students were taken to visit a number of chemical engineering related sites in BC and Alberta. Sites outside of Vancouver included Kamloops Centre for Water Quality, Domtar's pulp mill, Shell's Jumping Pound Gas Complex and Calgary Research Centre, Dow Chemical and Agrium. The students also had the opportunity to tour local facilities depending on their specialization. The process option students were taken to Xebec and Switch Materials while the biological option students visited Kinexus and Ballard. Many of the observed unit operations and lab techniques coincided with course topics. The Kamloops Water Treatment Centre was a great introduction for students taking the Water Pollution Control course as the tour gave them a preview of the unit operations that will be studied.

The students were acquainted with possible careers and inspired by the diverse opportunities. They were given the opportunity to learn on the field and to network with professionals. On behalf of all third-year Chemical & Biological Engineering students, we would like to thank Shell for sponsoring the trip - their continuous support is greatly appreciated. We also would like to thank all the companies for taking the time to prepare the tours and educating us about their facility and their industry. This experience was rewarding and most memorable.

The Chem-E-Car team members: Prof. Petrell, Megan Gao, Annie Jan, Yvonne Hsieh, Calvin Chan, Paul Kim, and Yan Zhang (not in photo)

CHBE Reaction Car

The Chem-E-Car Competition is an international competition held by the American Institute of Chemical Engineers (AIChE) wherein a student team must design, construct, calibrate, and run a model-sized car that is powered by a chemical reaction. The objective of the competition is quite simple: produce a cheap chemical reaction-powered car that can move a specified distance within two minutes while carrying a designated weight of water.

With numerous challenges, this year's CHBE reaction car team utilized pressurized gas produced from a citric acid and sodium bicarbonate reaction to power the vehicle. The gas was transferred to an air motor after passing through a regulator and filters. A major challenge was the construction and testing of the pressure vessel for storing the gas. Fortunately, CHBE has an outstanding workshop that was able to take CAD designs created by the team to construct the pressure vessel components and vehicle framework with great precision. Another challenge was calibration, essentially a distance vs gas or reagent curve. Since safety is always a concern, much research was conducted to determine chemical compatibility of materials, maximum pressure of all components, and pressure testing to ensure the safety of all participants.

CHBE's Chem-E-Car team took first place at the AIChE Pacific regional competition held at Oregon State University in April 2011. Following the win, the team went on to the National competition in Minneapolis. On October 16th, the team placed sixth out of 32 after travelling within a staggering 17.5 inches to the designated stop line. It is the best showing of a UBC reaction car to date!

The team showed great dedication by working relentlessly throughout the year, even with a full course load. The team was supervised by Dr. Fariborz Taghipour and Dr. Royann Petrell, both of whom donated countless hours to help the students in the project.

Community Service Learning

Community Service Learning (CSL) is a significant project wherein students use their expertise to help a community group further their goals and objectives. This year there are several exciting CSL projects in the works in the department.

One project is taking place in the fourth year lab and reaction engineering course. The community is the Comox Valley Project Watershed Society, and the project relates to the Society's blue carbon pilot and eelgrass restoration project. Blue carbon is an expression relating to how much CO_2 is stored in aquatic environments in sediments under plants such as eelgrasses and sedges. A blue carbon offset is a credit for greenhouse gas reductions achieved through uptake by plants and sediments. The society hopes to reap $100,000 from carbon offset funds that they will use to plant more eelgrass. Eelgrass beds are important for birds, fish, shell fish and aquatic animals, but unfortunately they have largely disappeared around the world due to habitat deterioration. This project will not only reduce atmospheric CO_2 levels, but help restore eelgrass beds.

Students in the reaction engineering course will examine a CO_2 eelgrass kinetic model to isolate the optimal conditions for the process. In addition three to four teams of students per year taking the fourth year lab course will work towards the development of a method to verify the rate in which carbon is building up under the eelgrass beds. This is important because to receive carbon offset funds the carbon capturing must be verified by a third party. With this project, CHBE students hope to become this third party. This year the students are setting up experimental eelgrass beds which will be used to develop the carbon monitoring methods.

Other CSL projects being planned for this year include the quantification of caffeine in coffee with the Fair Trade company Café Etico, and the environmental assessment of runoff from gasoline service stations on coastal water bodies with the Comox Valley Sierra Club.

The potential of eel grass for carbon sequestration is being examined.

Graduate Students

Academic Events

The Graduate Student Club (GSC) started the Professional Development Seminar to provide a variety of training opportunities on topics of professional development aimed at graduate students and postdoctoral fellows in the department. The first session was successfully held on October 11th with Dr. Naoko Ellis as the speaker to share her career journey. Dr. Ellis spoke about her experience from graduate study to faculty work in a lively and interactive way. The audience got a better idea of what to prepare for and expect from an academic career. Upon receiving positive feedback, the second session was held on November 30th and Dr. John Grace joined the group to talk about "some perspectives based on multi-faceted experiences as an engineering professor."

Social & Sports Events

Coffee breaks on Fridays after the weekly CHBE 598 seminar continue to be popular. It allows graduate students to mingle and catch up with each other, as well as with faculty members in a laid-back social atmosphere.

Graduate Club Executive (Left to Right): Fahimeh Yazdanpanah (VP Finance), Hooman Rezaei (VP Academic), Hafiz Rahman (GSS Representative), Ehsan Behzadfar (Sponsorship Coordinator), Alireza Bagherzadeh (Sports Coordinator), Tony Yang (President), Siduo Zhang (Social Coordinator)

On October 27th there was a Pumpkin Carving Social organized by GSC and Arts Club collaboratively. It was a fun event for everyone.

GSC also organized a ping-pong and foosball tournament, as well as volleyball, futsal and badminton teams.

The CHBE grad club Christmas party was held on December 6th. A number of CHBE graduate students, faculty and staff got together for a traditional turkey dinner.

Get Involved!

While studying is your main purpose here, getting involved in the University and the community is a great way to enhance your experience, develop new skills and widen your circle of friends. Drop us a line if you would like to join the CHBE Grad Club at CHBEgraduateclub@gmail.com.

Congratulations

Shell Canada Prize

Shell Canada has established prizes for the top fourth-year chemical and biological engineering design projects. The prize is designed to recognize students' activities and learning in their capstone design course.

For the 2010-2011 academic year, the Shell Prize for the fourth-year chemical engineering design project was awarded to the following student teams:

"The production of Penicillin G and 6-APA" Group:

Calvin Chan
Stacey Chen
Ruo Yu Gao
Alexandra Hall
Douglas Wan
Alan Ye

"Microbrewery for UBC New Engineering Student Center" Group:

David Chan
Edward Chow
Ken McClure
Lin Watt
Patrick Webb
Shannon Woods

"Electrical Power Generation from Sugarcane Bagasse" Group:

Alan Fung
Zackery Kosseim
Johhny Liu
Naeem Mawji
Art Pithayachariyakul
David Wu

Hydrate Conference Award

The 6th international conference on gas hydrate (ICGH) endowed a fund to the department in support of the 4th year capstone design course. The 2010-2011 winning projects are:

"Waste to Energy: Management of Municipal Waste in Metro Vancouver" Team:

Jeremy Alexander Anderson
David Yun Kun Chen
Pranav Sankar Chintalapati
Cecilia Djainai
Ruo Yan Cindy Liu
Sari Angelo Cuatico Ng

"Turning Farm Waste to Energy" Team:

Curtis Lindsey Christine
Dora Mou Yan Ip
Jaivan Krishnan
Kaitlynn Anne Livingstone
Roy Christian Olson
Margeret Claire Stuart

UBC Outstanding Future Alumnus Award

Congratulations to Lin Watt for receiving the UBC Outstanding Future Alumnus Award at the 2011 Engineering Excellence Celebration. Lin is a highly effective student leader who has brought major positive changes to the engineering student community, in addition to co-founding a start-up venture, Dragonfly Instruments.

Student of the Year

Congratulations to Naeem Mawji, Chemical Engineering co-op student. Mawji intends to alleviate poverty and improve the quality of life in rural Tanzania by providing sustainable, affordable electricity. His idea germinated through a UBC International Service Learning project and has grown into a company he co-founded, CarbonXEnergy, that has received funding through the World Bank.

Vickie Whiffen (left) with some of her undergraduate students

Killam Graduate Teaching Assistant Award

Congratulations to PhD candidate Vickie Whiffen, for being awarded the Killam Graduate TA Award! Vickie has set a high standard at CHBE – she is an incredible role model, incorporates new teaching skills, demonstrates a broad knowledge of the field, and shows the ability to help students actively. A well deserved honour.

...on a year of success

Bantrel Award in Design and Industrial Practice

Congratulations to Dr. Jim Lim, winner of the 2011 Bantrel Award in Design and Industrial Practice from the Canadian Society for Chemical Engineering (CSChE). This is an absolutely well deserved recognition of Dr. Lim's contributions to the practice of chemical engineering in industry and to the teaching of process design to UBC's students in Chemical Engineering.

The presentation of the award took place at the Annual Canadian Chemical Engineering Conference in London, ON in October 2011.

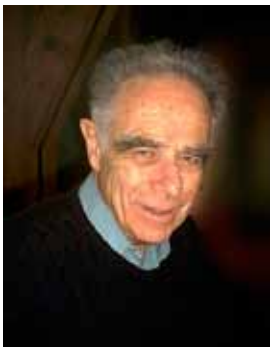
Outstanding Canadian Biomedical Engineer Award

Professor Ezra Kwok is the recipient of the Outstanding Canadian Biomedical Engineer Award for 2011-12 from the Canadian Medical and Biological Engineering Society.

The Outstanding Canadian Biomedical Engineer Award is presented to a Canadian biomedical engineer who has made outstanding contributions in the field of biomedical engineering. The Awards Ceremony took place on June 6th during the Canadian Medical and Biological Engineering Society's annual conference in Toronto.

Journal of Rheology Publication Award

Prof Savvas Hatzikiriakos received the Journal of Rheology Publication Award for 2011 for the paper: E. van Ruymbeke, E. B. Muliawan, T. Watanabe, S.G. Hatzikiriakos, A. Hirao, and D. Vlassopoulos, "Viscoelasticity and extensional rheology of model Cayley-tree polymers of different generations," J. Rheol., 54, 643-662 (2010).



UBC Engineering Outstanding Emeriti Award

Congratulations to Dr. Norman Epstein for receiving the UBC Engineering Outstanding Emeriti Award 2011. Dr. Epstein is a pre-eminent chemical engineer who has earned an international reputation for his research, teaching, publications and leadership while serving at UBC for more than 60 years.

Young Investigator Award

The research paper presented by Clare Yip (PhD candidate) at the 5th World Congress on Bioengineering won First Place for the Young Investigator Award. The conference was well attended by over 1000 delegates. The award recognizes the quality of research, its clinical relevance, and the presentation, which was well done by Clare. It was presented to Dr. Ezra Kwok and Clare Yip at the conference award banquet by the President of IEEE Engineering in Medicine and Biology Society, Professor Liang of the University of Illinois at Urbana-Champaign.

UBC Engineering Alumni Award

Congratulations to Dr. Eric Newell for receiving the UBC Engineering Lifetime Achievement Award 2011. Dr. Newell is a 1967 Chemical Engineering Alumni. Dr. Newell, OC, a retired business executive in the energy sector, is well-known for his successful and ongoing efforts to strengthen partnerships between education and business, and for championing corporate-social responsibility.

62nd Canadian Society of Chemical Engineering Conference

The 62nd Canadian Chemical Engineering Conference will be held in Vancouver, BC, from October 14-17, 2012. The conference will be organized by the Department of Chemical and Biological Engineering in collaboration with local government institutions and industries. The local executive committee consists of Maja Veljkovic (Chair), Xiaotao (Tony) Bi (Co-chair), Madjid Mohseni (Program chair), Tony Boyd (Program co-chair) and David Fung (Fundraising chair).

The main themes of the conference are energy, environment and sustainability, which are critical issues faced by the society and chemical engineers both in Canada and around the world. The conference theme also synchronizes with the United Nation General Assembly's declaration of 2012, "the international year of sustainable energy for all."

In addition to the regular technical programs in all aspects of chemical engineering, five special symposia are organized by multinational committees of experts in each field and include:

- 3rd International Symposium on Gasification and Applications
  (Chaired by John Grace)
- International Symposium on Biomass and Bioenergy
  (Chaired by Paul Watkinson)
- International Symposium on Fuel cells, Batteries and Electrochemical Technologies
  (Chaired by David Wilkinson)
- International Symposium on Sustainability
  (Chaired by Roland Clift)
- 6th International Symposium on Spouted Beds
  (Chaired by Jim Lim)

Graduate and undergraduate programs will be organized by our student committees to showcase the student contributions and to promote exchange of ideas for our young and bright chemical engineers.

We look forward to seeing you at the conference!

Speaker Series

We had an active Speaker Series schedule in 2010-2011, hosting a number of world-class researchers. You are welcome to visit our website to view bio's and abstracts, as well as upcoming events.
More: www.chbe.ubc.ca/news-events/speakerseries.

December 1, 2011	November 10, 2011
Dr. Jos Derksen, Chemical and Materials Engineering, University of Alberta.	Dr. Gilles Hebrard, Professor at INSA Toulouse in the Process Environmental Technology Department, and currently a Visiting Professor here at CHBE.
June 22, 2011	June 2, 2011
Dr. Enrique Iglesia, Professor at the Department of Chemical and Biomolecular Engineering at the University of California, Berkeley.	Dr. Shiping Zhu, Professor & Chair at the Department of Chemical Engineering at McMaster University.
March 18, 2011	February 22, 2011
Dr. Sirish L. Shah, Professor at the Department of Chemical and Materials Engineering at the University of Alberta.	Dr. Kenneth Breuer, Professor, School of Engineering, Brown University.
February 1, 2011	January 12, 2011
Marco A. Satyro, A.H. Younger Chair in Hydrocarbon Processing, Chemical and Petroleum Engineering Department, Schulich School of Engineering, University of Calgary.	Dr. Uttandaraman Sundararaj, Department of Chemical and Petroleum Engineering, University of Calgary.
November 30, 2010	November 19, 2010
Dr. Phillip Choi, Professor, University of Alberta.	Dr. Antonios K. Doufas, Senior Scientist/Research Leader at the Technology & Innovation Center of Braskem NA in Pittsburgh, PA.
October 18, 2010	September 24, 2010
Dr. Hideaki Kasai, Osaka University.	Dr. Francis Dullien, Professor Emeritus, University of Waterloo.