The Pulp and Paper Centre celebrated its 30th Anniversary on May 28th - which also happened to be the wettest day of 2016, and in fact, the wettest day in May in over 15 years. But it wasn’t enough to keep the crowds away! Close to a hundred people gathered on campus for the PPC’s Open House which included keynote speeches, interactive lab tours, a Poster Session, getting their hands dirty in the papermaking lab, and an opportunity to reconnect and network with their peers.

The Centre also organized an Alumni Dinner (on May 27th) that was attended by 16 guests including alumni, spouses and current faculty. The dinner was hosted by Mark Martinez and Richard Kerekes and was held at Dockside Restaurant inside the Granville Island Hotel. Many funny stories and memories were shared during the entertaining evening.

We hope you enjoy the next few pages that recap the memorable day.
Keynote speakers included Mark Martinez, Richard Kerekes, Heather Trajano and James Olson. These four stellar speakers gave top quality seminars on varying topics.

Mark welcomes guests who included alumni, industry partners & supporters, current students, staff and faculty, as well as several kids and families. The Centre’s mandate and teaching initiatives were introduced, followed by a short video presenting the new Master of Engineering Leadership (MEL) in Green Bio-Products professional degree program.

Richard gave the audience a historical perspective of the Centre’s early days. As the provincial government announced funding for new initiatives in engineering, John Grace, Head of Chemical at the time, suggested a possible Pulp and Paper Centre. Dick went on to sit on the Task Force that would put forth a proposal for the Centre. After more than 4 years of planning, construction began on an empty lot in 1984, at which point Dick was already appointed as the director. The Centre officially opened on January 7, 1986 with a similar Open House to the one 30 years later. It was a very enlightening, but also a very entertaining seminar!

Heather delivered (again!) her successful Applied Science 2015 Innovate talk in PechaKucha style: 20 slides of images for 20 seconds each (6 minutes and 40 seconds in total) to share her passion for Green Bio-Products. A very challenging and unique presentation, the audience was left impressed.

James presented an inspiring talk on the future of pulp and paper research. The Centre, in the heart of this province, is well positioned to lead the global society into a carbon neutral future. James reminded us that the Centre has a long history of innovation, but now has the potential to be exceptional around Industrial Biotechnology and Genomics. The overall message is that the future is bright and full of opportunity!
Following the seminars, the large group gathered in the Pulp and Paper Centre reception area for a catered lunch, an opportunity to chat, take photos with the “PPC30” balloons, view historical photos, get some swag and sign a celebratory poster that will be hung in the Centre for many years to come.

20 research posters were hung around the building and guests got the opportunity to speak with researchers about their interesting work.
Guests toured through the building facilities. Several researchers were on hand to demonstrate their research at individual lab stations, including the LC Refining Pilot Plant, the Biomass research group, and several researchers from the Energy Reduction in Mechanical Pulping group, among many others.

The machine shop was open for tours with David Roberts, Engineering Technician and Machinist, who was on hand for demos and to inform guests of the Technical Courses available to engineering students at the PPC Machine Shop.

The papermaking lab was also up and running. Kids & adults alike had a lot of fun making their own paper.

We would like to thank everyone for taking the time to attend the Open House, as well as to all students, staff and faculty for their participation and dedication to the Centre.

Videos of all presentations, as well as all photographs, will be available for viewing on the PPC website shortly.

PPC30 Organizing Committee members: Meaghan Miller, George Soong, Mark Martinez, Anna Jamroz, Sudipta Mitra and Pouyan Jahangiri.
We warmly welcome Professors Ángeles Blanco and Carlos Negro who are visiting the Pulp and Paper Centre for the summer.

Professor Blanco is a Visiting Professor working with Prof. James Olson’s Energy Reduction in Mechanical Pulping group working in the field of low consistency refining and nanocellulose. Prof. Blanco works in the Chemical Engineering Department of the Complutense University of Madrid (UCM). She is the leader of the Cellulose and Paper Research Group and of the Advance UCM-HOLMEN Laboratory placed within the facilities of Holmen Paper in Madrid. Her research activities are focused on pulp and paper research in the area of wet-end chemistry, paper recycling, deposit control, sustainable water use and recently on nanotechnology and on development of treatment trains for water reuse in different industrial sectors (chemical, petrochemical, pharmaceutical, food...).

She has participated in 22 European projects and in more than 50 industrial projects. She has received the “Prize for the Transfer of Technology and Knowledge of UCM 2016” and the “International Inorganic Bonded Composite Materials Conference – IIBCC 2008 Excellence Award in Recognition of Outstanding Research on Inorganic Bonded Composites”. She has published more than 120 research papers, 150 papers in conferences, she has collaborated on 12 books, 2 encyclopedias, 4 patents and in the organization of 15 international conferences.

Carlos is a Visiting Professor at the Dept. of Chemical and Biological Engineering and is working with Peter Englezos. He chairs the next World Congress in Chemical Engineering (WCCE30, Barcelona 2017) his main interest is to engage the Canadian Chem Eng community in this global event.

Reanna Seifert joins the Energy Reduction in Mechanical Pulping research program as a Laboratory Technician. Reanna is transferring her mineral processing skills to the world of pulp testing. As a lab technician she will be assisting the ERMP staff and researchers with low consistency refining trials at UBC-PPC and performing sample testing. Similar to her work in mineral exploration, she will be performing preparation work and testing of various pulp samples to determine their physical properties.

Reanna attended the University of British Columbia to study geology, earning her B.Sc. in 2013. Through UBC’s Science Co-Op program she worked at several mine sites across Canada from copper mining in northern BC to iron ore in Labrador. After her studies she took a position as lab assistant at C.F. Mineral Research, a geochemistry laboratory based in Kelowna. Founded by Charles E. Fipke, discoverer of the Ekati diamond mine, C.F. Mineral Research is a world-renowned mineral testing facility, specializing in diamond research. Reanna was involved in numerous projects ranging from gold to diamonds, pulverizing rocks to operating electron microprobes.

Conference Proceedings

The Pulp and Paper Centre was once again invited to host their own session at the PacWest Conference in Jasper, AB. On Friday June 10\textsuperscript{th}, six researchers gave 20 minute presentations on their innovative work. The UBC Student Session was chaired by Professor Heather Trajano, Chemical and Biological Engineering.

Jingqian Chen, Xue Feng Chang, Xinyi Chen, Rodger P. Beaton, Heather L. Trajano

“Optimization and Modelling of Hemimellulose Oligomers Production from Pulp Mill Residues for use as Pulp Strength Additives”

Jingqian is currently a PhD candidate in Chemical and Biological Engineering working in Dr. Trajano’s group with a research focus on softwood hemimellulose extraction, hydrolysis kinetic modeling and the hemimellulose application in pulp as strength additive. Jingqian presented the latest findings of optimizing the conditions for oligomers production from three mill residues: chip fines, hog fuel, and primary sludge. By strengthening interfiber bonding, absorption of hemimellulose oligomers to cellulose fibres has been found to improve paper strength and lower beating time and energy consumption. It is probable that absorption of hemimellulose oligomers obtained from sources such as wood chips and seeds will further improve the properties of NBSK pulp.

Jingqian was awarded the Best Student Paper at the Conference.
The potential benefits to the MP process of using steady-state simulation results also demonstrate the proposed MP processes to reduce the energy cost and guarantee closed-loop stability and convergence to the steady state. Simulation results show that there are three typical stages during the formation of micro-fold. The effects of various control parameters on the tissue structure has also been demonstrated to be an attractive alternative feedstock for bio-based products such as bioethanol and dissolving pulp. High speed imaging study is performed for many products belonging to the tissue industry. Although paper has been used for a long time to clean up spills, the process of how this works has been moderated by Carlo Dal Monte of Catalyst Paper.

One day ahead of the PacWest Conference, the Energy Reduction in Mechanical Pulping (ERMP) program held its bi-annual Steering Committee meeting. The program is now in its 10th year with funding from Natural Sciences and Engineering Research Council of Canada (NSERC) along with a consortium of 16 industrial partners and a collaboration with four universities (UBC, BCIT, UVic and UofT). The program’s goal is to reduce energy and greenhouse gas emissions of one of BC’s largest industries by 50 per cent before 2020. The meeting was an opportunity for students and researchers of the program to provide updates on their individual projects and to highlight some successes and challenges, as well as for the industrial partners to discuss some of the technical challenges their mills are facing, and research needs that could be addressed by future ERMP program work.

During the PacWest Conference, Dr. James Olson, Associate Dean, Research & Industrial Partnerships at UBC’s Applied Science, was part of a Panel Discussion on “Embracing Technology” along with some of the ERMP partners: Canfor Pulp, West Fraser, and FPInnovations. The session was moderated by Carlo Dal Monte of Catalyst Paper.

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Daniel Paterson describes the discovery  

Removing water from liquid-solid mixtures rapidly and effectively has long been a particular challenge for industries such as papermaking, wastewater treatment and mining.

But now, researchers from UBC and the University of Cambridge have developed an important building block for designing powerful machines that can “dewater” dense suspensions, like paper pulp, sludge or mine tailings.

“Drying is a very expensive operation, requiring significant amounts of energy. By formulating a theoretical model that predicts how the suspension will behave under pressure, we now know exactly how much compression speed to apply to get the best results,” explained study co-author Daniel Paterson, PhD student in chemical and biological engineering at UBC.

The mathematical model built by Paterson and his colleagues predicts how the solid part of a suspension as a whole reacts to pressure, and effectively has long been a particular challenge making production difficult. By understanding the drying of natural fibres, we can contribute to process optimization used in existing drying operations and effectively has long been a particular challenge making production difficult.

“We have a new theoretical framework to model how suspensions behave under pressure,” said Paterson. “This solid structure resulted in a tight, compact region of fibres near the compressing piston, which required a higher load to continue to squeeze the suspension’s liquid through. With the cellulose fibres’ hollow structure, more uniform fibre distribution occurred throughout the suspension, meaning less load was needed to squeeze the liquid out.”

The findings has implications for equipment and process optimization used in existing drying operations, and industries that are exploring the use of biomass, or plant materials, such as cosmetics and nutraceuticals.

“Biomass provides an exciting alternative to oil-based plastics, however possess difficult drying challenges making production difficult. By understanding the drying of natural fibres, we can contribute to these developing industries,” said Paterson.

The group is working with industrial partners to develop simulation tools for designing industrial machinery.

“The poorer dewatering performance of the nylon fiber was due to the fibre’s solid structure,” explained Paterson. “This solid structure resulted in a tight, compact region of fibres near the compressing piston, which required a higher load to continue to squeeze the suspension’s liquid through. With the cellulose fibres’ hollow structure, more uniform fibre distribution occurred throughout the suspension, meaning less load was needed to squeeze the liquid out.”

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The Master of Engineering Leadership in Green Bio-Products students had the opportunity to visit the Bioenergy Research and Demonstration Facility (BRDF) located at 2337 Lower Mall, Vancouver on March 29, 2016. The tour was planned to give the students an insight into Nexterra’s combined heat and power (CHP) bioenergy system. The facility is a result of a collaboration between UBC, Nexterra and GE, and UBC is the first Canadian University to establish such a facility to produce heat and electricity from renewable biomass.

The tour was hosted by Mr. Jeff Griffin, Energy Conservation Manager at UBC’s Energy and Water Services. Mr. Griffin and his colleagues provided the students with a comprehensive tour of the facility, which included the Research Center Lab, the wood-fuel supply system, the Operations room, the Biomass Gasifier, and the Jenbacher internal combustion engine from GE.

The tour was a valuable learning experience for the students, and the knowledge they obtained will assist them in excelling in their academic and professional careers.

Later in May, the students visited the Canfor Pulp Innovation (CPI) facility in Burnaby, BC and the Howe Sound Pulp mill in Port Mellon, BC. The CPI visit was spearheaded by Ranbir Heer, CPI Chemist and MEL-Green Bio-Products student. CPI follows Canfor’s signature “search and apply” innovation approach to collaborate with global experts to develop technology solutions to address customer needs. In addition to world-class expertise, with in-house lab and pilot scale facilities, CPI is uniquely positioned to efficiently develop mill-ready solutions.

During the visit the students had the opportunity to learn about some of the projects at CPI and see the analytical facilities including pulping equipment, the PulPylex pulp testing system, paper testing equipment, and wood and biomass characterization instrumentation. Dr. Paul Bichs, Manager-Optimization and Innovation, explained the research and innovation strategy and answered students’ questions on various topics related to pulp, paper and bio-products providing them with excellent insight into industry R&D operations.

Howe Sound Pulp and Paper is a leading manufacturer of Kraft pulp and paper in North America. The Port Mellon mill was the first to produce wood-based paper in British Columbia in 1909. It is also one of the leading employers in the Sunshine Coast community.

Research Excellence

French-press coffee maker press inspires ‘drying’ discovery

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"Dewatering of Fibre Suspension by Pressure Filtration" was published in Volume 28, Issue 6, June 2016 in Physics of Fluids.


MEL - Green Bio-Products: Tours

The BRDF has two modes of operation, Thermal and CHP. The Thermal Mode produces only heat energy, i.e. steam, while the CHP Mode, produces both electrical and thermal energy. Since coming online, the facility has consumed almost 23,000 ton dry metric tonnes (DDMT) of woody biomass. Concurrent operation of all assets realized by achieving dual-fuel capability, has produced an approximately 75% increase in energy production. This significant increase in energy output has maintained the financial viability of the facility allowing it to function within the economic expectations of UBC despite recent price reductions in natural gas.

The tour was a valuable learning experience for the students, and the knowledge they obtained will assist them in excelling in their academic and professional careers.

Cont. on page 14

Left: MEL Green Bio-Products students and Dr. Sella Kapu, Instructor (in red) and Jeff Griffin, Energy Conservation Manager (far right) at the BRDF facilities.

Right: MEL Green Bio-Products students at the Howe Sound Port Mellon mill.

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BECOME A GREEN BIO-PRODUCTS ENGINEERING EXPERT

If you’re thinking about concentrating your career in the green bio-products sector, think about the difference a year at UBC can make. Build knowledge. Cross disciplines and boundaries. Gain confidence. Master the leadership skills that will take you to the next level. Invest in yourself, and in the growing bio-economy, at UBC.

mel.ubc.ca
Upcoming Events

Advanced Biofuels Symposium
July 6-8, Sheraton Wall Centre, Vancouver
This Symposium brings together multi-disciplinary experts in the energy field, including top researchers, industry leaders and innovators from many sectors, to discuss key issues related to the development of a thriving advanced biofuels industry. More info at www.biofuelnet.ca

Imagine UBC
Sept. 6, full day, various events around campus.
A one-day orientation for new and returning students. The Main Event (massive celebration and a fantastic opportunity to find out what’s happening on campus for the coming school year) runs 1:00-4:30pm along Main Mall. Visit UBC Events and Student Services to see how you can get involved and to find out about all events.

Seminar: Real-Time Imaging of Plant Cell Wall Nanoscale Architecture and Biodegradation
July 7, 12:00-1:00 pm, CAWP 2916
Join Dr. Shi-You Ding from Michigan State University for an interesting talk by one of the leading experts in using AFM to visual cell wall traits and degradation.

PPC Annual General Meeting
September 16, 12:00-2:00 pm
Mandatory AGM for all PPC occupants. Pizza lunch will be served. Contact Anna Jamroz to add agenda items.

Safety

Reanna Seifert received the June Lab Safety Inspection award for keeping the papermaking lab clean and well organized.

UBC Emergency Procedures for Active Shooter are now available at: http://rms.ubc.ca/emergency/emergency-procedures/active-shooter/

Social Media

Follow us on Twitter @ubcPPC
NEW: MEL Green Bio-Products @MELgreenbio

Like us on Facebook /ubcPPC
NEW: MEL Green Bio-Products /UBCMELgbp

Visit us online: www.ppc.ubc.ca

Thanks for all your TWITTER support. Below we share a few of our recent tweets:

UBC Public Affairs 13 JUN
Dr. Santa Ono @ubcprez to become UBC President and Vice Chancellor

UBC Pulp & Paper Centre @ubcPPC 25 MAY
RT: RMH BC @RMHBC (Ronald McDonald House) Thank you to Mark Martinez and @ubcPPC for bringing our families a great paper-making workshop last week!

UBC Pulp & Paper Centre @ubcPPC 17 MAY
Congratulations to PPC’s Nick McIntosh, named 2016 APSC Rising Star #UBCAPSCstars @ubcengineering

UBC Applied Science @ubcppscience 21 APR
Congratulations to Dr. John Grace of @CHBEUBC @ubcPPC for his UBC Engineering Outstanding Emeriti Faculty Award!

Contact

To submit items to PPC’s Pulp Digest or to join our mailing list, please contact Anna Jamroz, Communications Coordinator at: anna.jamroz@ubc.ca