

# Pulp Digest

Q1 2016

## PPC's 30<sup>th</sup> Anniversary Open House - May 28, 2016



Join us at the Open House for a day of celebrating this milestone and the remarkable achievements of our PPC community. The Open House will give our alumni the opportunity to reconnect and network with their peers, faculty members, and today's talented students, and it will also give students the opportunity to meet PPC alumni and industry professionals in a fun and informal setting. There is no cost to attend the Open House and all registered participants will receive a light lunch. See pg. 2 for full program.

The Centre is also organizing an Alumni Dinner the night before the Open House. \*You can join us at both events, or as your schedule permits\*

**We've lost touch with some of our alumni and need your help! Please help us spread the word to anyone who you still keep in touch with. We hope to see you all in May.**

#### Open House Event Details:

Saturday May 28<sup>th</sup>, 2016  
11:00-5:00 pm  
*(Join us for the whole day,  
or stay for a while)*  
Pulp and Paper Centre  
2385 East Mall, Vancouver

#### Alumni Dinner Details:

Friday May 27<sup>th</sup>, 2016  
6:00-10:00 pm  
Vancouver BC  
Cost of \$100 per person associated  
with this event

**RSVP at:**  
[www.ppc.ubc.ca/ppc30](http://www.ppc.ubc.ca/ppc30)



# PPC's 30<sup>th</sup> Anniversary Open House - May 28 Program

Join us for the whole day, or stay for a while.

MORNING -

UBC CENTENIAL CELEBRATIONS

Check [ubc100.ca](http://ubc100.ca) for event listings

11:00-12:00PM

SPECIAL SEMINARS\* with

**Mark Martinez**, PPC Director & Prof. in Chemical & Biological Engineering  
**Richard Kerekes**, Former PPC Director  
**James Olson**, Associate Dean for Research & Industrial Partnerships  
**Heather Trajano**, Asst Professor, Chemical and Biological Engineering

12:00-5:00 PM

OPEN HOUSE\*

Reconnect with old friends and see what's new at the PPC!

Interactive Lab Tours  
Poster Session  
Handsheet making for the whole family  
(oh the memories!)  
Meet and network with grad students

...AND SO MUCH MORE!

12:00-1:30PM

LIGHT LUNCH

LOCATIONS:

\***Seminars** (11:00-12:00 pm) @ Chemical and Biological Engineering building  
2360 East Mall, John R. Grace classroom #102

\***Open House** (12:00-5:00 pm) @ Pulp and Paper Centre  
2385 East Mall

**Alumni Dinner** hosted on May 27<sup>th</sup>. visit [ppc.ubc.ca/PPC30](http://ppc.ubc.ca/PPC30) for details and registration

## New Faces



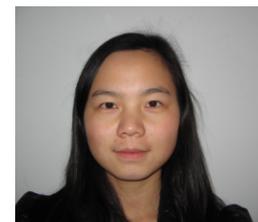
Nuwan

The Centre welcomes back **Nuwan Sella Kapu!** Nuwan is now an Instructor for various courses for UBC's new MEL in Green Bio-Products professional program. Nuwan has more than fifteen years experience in the plant sciences and biomass processing. He obtained his Ph.D. (2006) in Plant Biology specializing in cell wall biology and biochemistry from the Pennsylvania State University, University Park. In 2007, he joined Expansyn Technologies, Inc., a start-up company, as Principal Scientist to spearhead research and development programs to commercialize plant cell wall proteins to produce biofuels. From 2010-2015 Nuwan led research efforts in ethanol fermentation and bamboo pulping with Drs. Jack Saddler, Mark Martinez and Rodger Beatson at UBC. He later joined FPInnovations as a Scientist in the Chemical Pulping-Process Engineering group and worked on mill-targeted, applied research programs in kraft pulping. His current research interests are focused on developing technologies for bio-products and biorefineries.

**Yuan Liu**, Visiting Scholar working with Prof. Mousa Nazhad on the Foam Paper project.

**Jordan Mackenzie**, returns as Post-doctoral Research Fellow working with Prof. Mark Martinez.

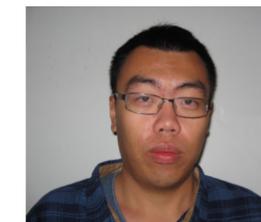
**Chao Qu and Yinfeng Zhao**, both Visiting Scholars working on the Biomass Gasification project with Prof. Xiaotao Bi.



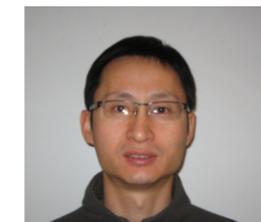
Yuan



Jordan



Chao



Yinfeng

## Publications & Awards

### Journal

**Xue Feng Chang**, Antti Luukkonen, J.A. Olson, Rodger Beatson "Pilot-Scale Investigation into the Effects of Alkaline Peroxide Pre-Treatments on Low-Consistency Refining of Primary Refined Softwood TMP", *BioResources*, Volume 11, Issue 1, page 2030, February 2016

**Abstract:** Primary refined coarse softwood thermomechanical pulp was treated with alkaline peroxide prior to low-consistency (LC) refining. The effects of the pre-treatments on pulp quality, refinability, and electrical energy consumption were assessed. Four pre-treatments were conducted with alkali charges of 2.5 and 6% and peroxide charges of 3 and 4%. The pulps were refined to specific energies up to 600 kWh/t by multiple passes through an LC refiner at intensities of 90 and 150 kWh/t. It was found that alkaline peroxide treatments increased tear strength and protected the fibre from cutting, especially during high intensity refining below a specific energy of 300 kWh/t. Treatment with 6% NaOH and 4% or 3% H<sub>2</sub>O<sub>2</sub> led to lower brightness gains and scattering coefficients but increased the tensile strength index by 31%, potentially lowering the total electrical energy required to achieve strong pulp. The enhancement of tensile strength caused by the highly alkaline peroxide mostly resulted from increased bonding, which was attributable to acid group generation rather than the promotion of further fibrillation during LC refining.

**R. Harirforoush**, P. Wild, J.A. Olson, "The relation between net power, gap, and forces on bars in low consistency refining", *Nordic Pulp and Paper Journal*, Vol 31, no (1) 2016

**Abstract:** The objective of this study is to experimentally investigate the relationships between local bar forces, plate gap and fiber length in a single-disc low consistency refiner. Piezoelectric sensors are used to measure normal and shear forces applied to pulp fibers by the refiner bars. It is shown that there is a non-linear relationship between measured bar forces and length-weighted fiber length that mirrors the established relationship between length-weighted fiber length and the inverse of plate gap. As the plate gap is reduced, the length-weighted fiber length remains relatively constant while net

(Cont. on pg 4)

## Journal Cont.

### R. Harirforoush cont.

refiner power and the mean peak normal and shear forces increase. These trends continue up to a threshold values of mean peak normal and shear forces of approximately 8 N and 2.4 N, respectively. Above this threshold, mean peak normal and shear forces continue to increase but the length-weighted fiber length exhibits negative linear relationships with these forces. These results can be used as the initial study for onset detection of fiber cutting and that these sensors have promising potential to be used as the basis for advanced refiner control strategies.

**Jiyang Gao, D.M. Martinez, J.A. Olson, "Characterizing latency removal in mechanical pulping processes part 1: Kinetics", TAPPI Journal, Vol 15, no (2) February 2016**

**Abstract:** Latency removal in the mechanical pulping process occurs in a continuous stirred-tank reactor and non-ideal mixing lowers the performance. In order to optimize the latency removal process and reduce the energy consumption in the operation, a kinetic study was carried out. In the study, the phenomenon of latency and knowledge related to latency removal were critically reviewed and discussed. Latency removal was characterized by the change of Canadian Standard Freeness (or freeness), and its dependences on treatment conditions, i.e., disintegration temperature, power input, pulp consistency and time, were determined. Kinetic models of latency removal for secondary refiner thermomechanical (TMP) and bleached chemithermomechanical (BCTMP) pulps have been developed, which were based on the rate of latency elimination characterized by the decrease of freeness.

**Hayder J. Salem, Robert Gooding, J.A. Olson, "The effect of foil rotor design on some aspects of pulp screen performance", Nordic Pulp and Paper Journal, Vol 31, no (1) 2016**

**Abstract:** The performance of three foil rotors was assessed using a range of rotor speeds and slot velocities. Power consumption and pulse strength both increased with increased foil thickness. While screen capacity generally increased with pulse strength, there was not a simple and direct correlation and other factors remain important. Capacity was found to be determined by factors other than simply the greatest magnitude and frequency of backflush pulsations.

S. K. Mahadeva, K. Walus, **B. Stoeber**, "Flexible and Robust Hybrid Paper with Large Piezoelectric Coefficient," accepted for publication in the Journal of Materials Chemistry C (RSC), Jan. 2016

**Abstract:** This report describes the fabrication of hybrid paper made from wood fibers to which barium titanate (BaTiO<sub>3</sub>) nanoparticles were anchored. This hybrid paper is mechanically as strong as commercial printing paper (breaking strength = 1.55N/mm<sup>2</sup>), it is flexible and possesses a large piezoelectric coefficient ( $d_{33} = 37 - 45.7 \pm 4.2$  pC/N). Using this paper, we demonstrate an accelerometer, with a sensitivity of 82.45 pC/g. The accelerometer is formed by laminating the piezoelectric paper with electrodes made from conductive ink and a seismic mass is bonded to this assembly. According to our model, the dynamic range, 1-70 Hz, of the sensor can be increased by reducing the seismic mass at the expense of a lower sensitivity.

A. Elahimehr, J.A. Olson, D.M. Martinez, "Low consistency refining of mechanical pulp: how plate pattern and refiner operating conditions change the final properties of pulp", Nordic Pulp and Paper Journal, Volume 30, Issue 4, page 609, December 2015.



Gao's experimental setup featured on the cover of TAPPI Journal

## Conference Proceedings

**R.P. Beatson, "A Mechanistic Look at Lignin Sulfonation," Pacificchem Conference, Honolulu Hawaii, Dec 16, 2015.**

**Yu Sun, X.F. Chang, J.A. Olson, R.P. Beatson, "Study on alkaline oxygen treatment of high freeness TMP pulp followed by lab-scale Low-consistency Refining," PAPTAC PaperWeekCanada, Feb 2016.**

## Conference Proceedings Cont.



Reza and Yu at PaperWeek

**Yu Sun, X.F. Chang, J.A. Olson, R.P. Beatson, "A comparison of different chemical treatments on the properties of TMP pulp followed by low-consistency refining," PAPTAC PaperWeekCanada, Feb 2016.**

**Reza Harirforoush, P. Wild, J.A. Olson, "In-process detection of fibre cutting in low consistency refining using a bar-force sensor," PAPTAC PaperWeekCanada, Feb 2016.**

**Hui Tian, Q. Lu, B. Gopaluni, "Economic Nonlinear Model Predictive Control for Thermo-Mechanical Pulping Processes," accepted to American Control Conference, Boston, MA, July 2016.**

## Awards



PPC's **Jingqian Chen**, PhD in Chemical and Biological Engineering, received an honorable mention at the **2016 3MT Semi-Finals** for her presentation on "*Paper Inside Out: Secret Ingredient for Better Paper Strength*". She then moved onto the Finals held at UBC on March 10<sup>th</sup>. 3MT is an academic competition that assists current graduate students with fostering effective presentation and communication skills. Participants had just three minutes to explain the breadth and significance of their research project to a non-specialist audience. Videos of all presentations are available online at [3mt.grad.ubc.ca](http://3mt.grad.ubc.ca)

PaperWeek Canada, the major Canadian gathering for the advancement of the pulp and paper industry, was held in Montreal on February 1-5, 2016. This year the University of British Columbia lead the organization of the "**Theo van de Ven National Student Community Poster Session**", named in honour for McGill's Prof. Theo van de Ven who is celebrating 40 years in industry's academia.

21 students from 8 universities across Canada participated. The list of winners is:

1st Place: Leila Jowkarderis (McGill University)

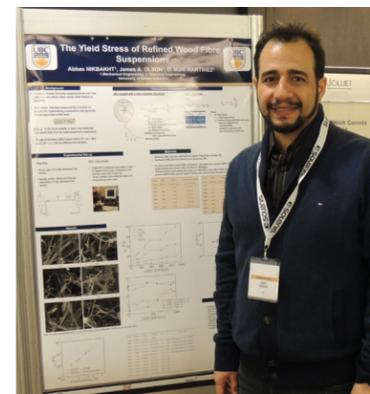
Poster Title: Mesh size analysis of cellulose nano fibril hydrogels with solute exclusion and PFG-NMR spectroscopy

2nd Place: **Abbas Nikbakht (UBC)**

Poster Title: The yield stress of refined wood fibre suspension

3rd Place: Xingye An (UNB)

Poster Title: Nano-fibrillated cellulose (NFC) as a carrier of TiO<sub>2</sub> nanoparticles (TNPs) for photocatalytic hydrogen generation



PPC's Abbas Nikbakht, 2<sup>nd</sup> place winner.



The inaugural **Master of Engineering Leadership and Master of Health Leadership & Policy Award Ceremony** was held on March 10<sup>th</sup> at the Professional Masters Studio, Gerald McGavin Building. Two students from the Green Bio-Products pillar, **Poonam Patel and Michael Coulson**, received the award.

Worth \$5000 per student, the recipients were selected based on criteria that included past and current academic performance, work history and class participation. The first award of its kind in the program, it will encourage the recipients to pursue further excellence in the field. The stiff competition ensures that that the students continue to reflect the high standards of pre-eminence that the new Master of Engineering Leadership program strives for.



Bill Adams  
Source: LinkedIn

Bill Adams, Director of Sustainability and Technology at Canfor Pulp, is also a UBC alumnus having graduated with a Masters of Chemical Engineering degree in 1991.

On February 29<sup>th</sup>, Bill joined us at the Centre for the inaugural **Industry Night** (see *Industry Night* on pg. 9) so we took the opportunity to ask Bill some questions to gain insight into his successful career and experience.

**Give us your career story in a nutshell. We'd love to hear what brought you to where you are now.**

My career has been an amazing journey of variety in terms of opportunity, locations and the roles that I have done in this exciting industry. I have worked in increasingly senior roles for four companies in 7 locations over my 30 year career. I am currently Sr. Director, Sustainability, Technical Services and Innovation at Canfor Pulp. This versatile role includes supporting Canfor Pulp's Innovation initiatives as well as leading our sustainability platform and global technical services. My career highlight was definitely leading the transformation at Domtar Kamloops which included \$150 million in capital investments over a 3 year period and securing a long term energy contract to sell renewable energy to BC Hydro.

**Is it typical for someone in the P&P industry to be able to explore various roles as much as you have?**

The pulp and paper industry is full of opportunities and progressive companies support career paths that enable talented individuals to explore various roles. In addition to working at multiple mills, I had the opportunity to work in operations, corporate development, capital project management, maintenance and strategic planning. The diversity of roles in the industry is a key reason why young professionals should strongly consider this industry.

**You have both a MEng and MBA degree - how have these degrees helped you along in your career?**

The combination of a technical and business acumen has enabled me to take on more challenging and strategic roles in my career. The ability to assess the financial aspects of the business will open doors if you are interested in focusing on the management side of the business. I spent two years at Weyerhaeuser's corporate office in Seattle in the Competitive Analysis group studying competitors, new technologies, cost benchmarking and market trends. I

required my MBA and engineering degrees to take the role and this experience has been invaluable to help lead the organizations I have been a part of ever since.

**You received your MEng. from UBC's Pulp and Paper Centre - care to share any fun memories??**

I was able to take 12 months off from my role as project engineer from Weyerhaeuser in Prince Albert to take the M.Eng. program. The program was a very intensive program and coming back to school after working in the industry for three years made the material so relevant and I truly enjoyed the year. We had a great class of 10 engineers that supported each other. One of the most memorable highlights was the field trip to PaperWeek in Montreal with the class. We met up with the McGill students from their pulp and paper program. The conference was a great week.

**The initiatives you lead must have social as well as strategic business goals. How do you work to balance these and make sure both are achieved?**

I feel very fortunate to work for a company that looks at sustainability as a core responsibility where social and business goals are strongly integrated. The challenge of balancing these values is much more straightforward. The leadership of the organization is very community minded and takes the environmental responsibility of our operations with great consideration. I can honestly say this has not been a challenge.

**From the time you began your career to its current stage, what are some of the key changes you have seen the industry go through?**

The global competition has really forced Canadian mills to really focus on increasing competitiveness. The mill operations are leaner in terms of staffing levels. This requires young engineers and technical staff to be more versatile. The focus on the biorefinery model for pulp mills brought



Industry Night with Bill Adams at the Pulp and Paper Centre, Feb. 29<sup>th</sup>

new excitement to the industry as the companies strive to secure additional revenue streams to stay competitive.

**What do you foresee as the biggest challenge in the industry over the next 10-20 years? Similarly, where do you see the market growing in the next 10 years?**

The biggest challenge will be the new hardwood capacity coming from South America which will put competitive pressure on the pulp producers in the Northern Hemisphere. The Northern Bleach Softwood Kraft industry in Canada will need to ensure we find markets that value the unique properties of the northern fibers. Those companies that can execute the transition to the biorefinery business model will be the successful companies. The next 10 years will see a growth in the specialty applications sector and the tissue sector. Companies that can adapt to the new markets will be the successful ones. This industry will also see a growth in biofuels, biochemical and biomaterials.

**Canfor is a big supporter of research at UBC. How do you choose what research to focus on and invest in?**

The Canfor model is designed to be a Search & Apply model that looks at technologies and applications that we can adopt at our mills or with our customers to increase value. We look to opportunities that can take advantage of the unique fiber opportunities in northern Canada. We look to research institutions with flexible business models and whose talent and experienced people can work efficiently with our research scientists and mill leadership to help solve our challenges.

**What are your thoughts on industry partnering with Universities to tackle challenging problems?**

We look to Universities as a key resource in our Search and Apply innovation model and have really embraced the

partnership with Universities and research organizations to deliver value to our organization. As one of the only Canadian pulp and paper companies with a research center, we hope to leverage our research investment through collaboration.

**What is a Sustainable Enterprise? Why is it important?**

Our approach to the Sustainable Enterprise ensure the Social, Environmental and Economic values are all key goals of our success. Canfor wants to be a strong community support and employer of choice in this industry while maintaining a strong environmental and economic performance. The top quartile of our mills has enabled us to invest in the competitive and environmental improvements of the mills we operate. The other key parameter is our fiber sourcing and to ensure we support fiber from sustainably managed forests.

**What is your advice to current graduate students who will consider pursuing a career in P&P/forestry?**

The pulp and paper industry and the related sectors like biofuels and biochemicals will be an increasingly exciting industry to work in because of the emerging values of sustainability and the desire to use renewable resources by our society. Advanced education in these fields will by key to be successful in the industry.

**What industry related blogs or books are you currently reading?**

I am an avid reader of industry literature including Pulp & Paper Canada and Paper 360 magazine. I also read a steady diet of sustainability literature and technical papers related to the forest products industry and the transformation technologies that are related to the biorefinery concepts. I attend two to three conferences each year and read the technical papers that are presented at the conference.

Madjid Mohseni is a Faculty Associate at the Pulp and Paper Centre. Dr. Mohseni recently lead a panel in an IC-IMPACTS workshop on creating partnerships for First Nations water infrastructure on March 8. He also presented at Water Ways, a UBC Centennial Emerging Research Workshop on March 8-11.

## Clean water no longer a pipe dream

For many remote communities, including First Nations communities, clean drinking water is far from assured. Many do not have proper infrastructure and resources to treat their water, and boil-water advisories are a frequent occurrence, particularly during spring runoffs.

This is what first inspired UBC chemical and biological engineering professor Madjid Mohseni to take action. He has been working with remote and First Nations communities for more than 15 years to develop local, reliable water treatment systems. Mohseni is also the scientific director of RES'EAU-WaterNET, an organization working to develop sustainable water-treatment technology for small rural communities, and is currently funded by IC-IMPACTS, which promotes research collaborations in water, infrastructure and public health. In this Q&A, he explains how his team helped design a water treatment system for a First Nations community in Lytton, B.C.

### Why is providing clean drinking water such a challenge in certain areas in B.C.?

Many rural and First Nations communities are remote and scarcely populated, and hence are disproportionately affected by a lack of access to reliable and safe drinking water. For example, one community we're working with is reached by a single, 70-kilometre logging road. Many communities like this draw water from streams or wells or have it delivered. But deliveries can be cancelled due to storms and impassable roads. Natural sources could become contaminated by spring runoffs and other factors. At any given time, B.C. has an average of over 500 boil-water advisories, nearly all of them affecting remote, rural and First Nations households.

### What disinfection solutions are you working with and how do they work?

One of the focus areas for my research is ultraviolet (UV) technology, an established and proven process for disinfecting water. Ultraviolet light alters the DNA of the microorganisms in water, inactivating or preventing them from causing infection. It is inexpensive, robust, and easy to set up, operate and maintain. It can be monitored remotely. All this makes it a viable solution for remote communities with little capacity and resources.

### What is your approach to working with partner communities?

We work closely with a number of First Nations and other partners to develop solutions that match the specific needs of each community.

One of our partner communities has been the Lytton First Nation, which has an added challenge of being very spread out, spanning more than 100 kilometers. Some of the reserves are no more than five or 10 households. We started by meeting and talking with the band members, including elders and water operators, to learn more about their needs.

Collaborating closely with the band and our government and industry partners, we designed a treatment system for a pilot site: a community of six households on the far side of the Fraser River. The treatment uses filters, activated carbon and UV light, and then a small amount of chlorine is added before it is available by tap. Previously, this community had a 30-year-old, inadequate water treatment system and was under boil-water advisories two or three months out of the year.

### How is the new plant working out?

The community members are generally happy with the new system. It's also worth noting that they were previously quoted a price of more than \$1 million for water treatment. Our approach to bring solution through collaboration with the community and other partners cost less than half of that, and that's with research costs factored in.

### What's next?

We'll continue working with several other communities to come up with sustainable water solutions. It's entirely feasible to replicate the success of our community-centric solution-finding strategy in other communities.

We're improving our approach as well as technological solutions. For instance, we are working on the next generation of UV sources, which are capable of breaking down and eliminating harmful chemicals that might be present in water.

As featured on UBC News, March 7, 2016

The Master of Engineering Leadership (MEL) in Green Bio-Products is a new program jointly offered by the UBC Faculty of Applied Science, Faculty of Forestry and the Sauder School of Business, and its goal is to train the future leaders and professionals of the growing bio-products sector. To give students insight into this exciting field, Industry Nights are being arranged so experienced professionals can share their working experience with students.

The inaugural Industry Night took place on February 29<sup>th</sup>. with Bill Adams, Director of Sustainability and Technology at Canfor Pulp, and also a UBC alumnus. Bill gave a detailed presentation on his organization's history, and provided valuable insight into the current state of affairs and what the future holds. The session was extremely successful and attended by a large group including students, faculty and staff (see pg. 6-7 for Q&A with Bill Adams)

The 2<sup>nd</sup> Industry Night is scheduled for April 12<sup>th</sup>, and the speaker will be Dr. Robert Gooding. Robert is Vice President at Aikawa Fiber Technologies, and he is also an Adjunct Professor at the Department of Mechanical Engineering at UBC.

If you would like to get involved with Industry Night or have suggestions for speakers, please contact Salman Zafar, Program Assistant at [salman.zafar@ubc.ca](mailto:salman.zafar@ubc.ca)

## MEL tour FPIInnovations

The MEL Green Bio-Products students had the opportunity to visit the FPIInnovations Research Centre located at 2665 East Mall, Vancouver on March 21<sup>st</sup>. The tour was planned to give the students an insight into one of the world's largest R&D organizations in Forestry.

Headquartered in Pointe Claire, Quebec, the organization has 11 major research programs including market pulp, biomaterials, biorefinery & energy, forest operations and wood products manufacturing. Some of FPIInnovations' recent successes include the world's first cellulose filament demonstration plant, established in partnership with Kruger Inc. and CelluForce, a joint venture with Domtar Inc. and Schlumberger, which operates the world's first cellulose nanocrystals plant. Moreover, Canada's first commercial-scale lignin recovery plant at West Fraser's Hinton Pulp Mill will use LignoForce technology developed by scientists at FPIInnovations.

Dr. Ho Fan Jang, Dr.Tessie Tong and Mr.Tim Caldecott treated the students to a comprehensive tour of the research facilities including the Silviscan system, Confocal Microscopy Scanning Electron microscopy, and the Building Systems Lab.

Silviscan houses equipment and assorted software that enable the non-destructive, high-throughput evaluation of the structure and quality of wood. The system uses optical microscopy, X-ray densitometry and X-ray diffractometry to analyze a wood sample and the results have wide applications in solid wood, pulp and paper products manufacturing. Confocal microscopy allows high resolution imaging of a material, and at FPIInnovations the technique is used to support new product development and pulp and paper product quality control. The Building Systems Lab develops alternative wood building system solutions for a number of industry sectors, including platform frame wood construction, heavy timber frame construction, cross-laminated timber (CLT), and hybrid construction. The lab is also conducting tests on UBC's 18 storey, wood-based student residence, which is currently under construction and is scheduled to open in September 2017.

Following the tour, students met with Dr.Trevor Stuthridge, Executive Vice President, FPIInnovations for a lively Q&A session. Dr. Stuthridge provided valuable insight into the organization's business model, future opportunities and possible challenges.

Tim Caldecott, FPIInnovations (far left) with MEL Green Bio-Products students and Dr. Sella Kapu, Instructor, at the FPIInnovations Building Systems Lab.



## Intro to Pulp and Paper Technology

A three-day course sponsored by the Advanced Papermaking Initiative (API) at the University of British Columbia

### Who should attend:

This introductory-level course is suitable for current engineering students, including coop, along with recently hired engineers working in BC pulp and paper mills and supporting industries. Suitable for both technical and non-technical individuals who want to understand basics of BC's natural resource, chemical and mechanical pulping, bleaching, recovery, papermaking, and paper grades and properties.

### Description:

This hands-on course will consist of lectures during the mornings, and lab exercises in the afternoons to re-emphasize material and enhance understanding of process.

The course will provide an overview of:

- Natural Resources
- Mechanical Pulping history, theory and comparisons with chemical pulping
- Kraft Pulping, Bleaching and Recovery
- Pulp processing equipment, theory and operation of pulp screening, cleaning and low consistency refining
- Papermaking theory of forming, pressing and drying
- Chemical additives in the wet end of the paper machine
- Future bio-products and the transformation to a sustainable bio-economy

April 13-15, 2016

Visit [www.ppc.ubc.ca/courses](http://www.ppc.ubc.ca/courses) for registration

## Intro to Machine Shop Course

Part of the Pulp and Paper Centre's *Professional Development Series*, students now have an opportunity to enroll in a 9 hour, hands-on course.

**Introduction to Machine Shop** will teach participants the fundamental skills required for basic machine shop operations. Through a combination of lectures and project work, students will learn how to use precision measurement tools such as micrometers and vernier calipers, learn the processes required for semi-precision layout, cutting speeds and feeds, Horizontal Band Saw operation, Sensitive Drill Press and drilling operations, threads types and thread cutting.

Comprised of theoretical lectures, demonstrations and videos, learning will be reinforced by building a project from start to finish using industry standard tools and methods. The course Instructor is a Certified Machinist and Engineering Technician.

Visit [www.ppc.ubc.ca/courses](http://www.ppc.ubc.ca/courses) for dates and registration

## Technical Training Course

As part of the Pulp and Paper Centre's Professional Development Series, current UBC Engineering students, including Co-op, have an opportunity to enroll in a 18 hour, hands-on course which will provide an orientation of the workshop, safety training, and an overview of:

- Safe Operation of Machine Shop Tools
- Hand tools
- Precision Measurement and Layout
- Pipe and Tube fittings
- Pumps and Valves
- Swagelok Fluid System Components

Comprised of theoretical lectures, demonstrations and videos, learning will be reinforced by building a project from start to finish using industry standard tools and methods. The course Instructor is a Certified Machinist and Engineering Technician.

Visit [www.ppc.ubc.ca/courses](http://www.ppc.ubc.ca/courses) for dates and registration

## Fluid Systems Course

As part of the Pulp and Paper Centre's (PPC) Professional Development Series, Engineering students now have an opportunity to enroll in a 9 hour, hands-on course.

**Fluid Systems** will teach participants the fundamental skills required for rudimentary pipe and tubing assemblies. This course focuses on pipe and tube, and an introduction to pumps and valves. Students will learn how to identify sealing thread types, the differences between pipe and tube, pipe fitting basics including pipe thread cutting and assembly, compression tube fitting and bending, and methods for fluid system leak testing. Learn how to identify and apply different types of pumps and valves.

Comprised of theoretical lectures, demonstrations and videos, learning will be reinforced by hands-on work using industry standard tools and methods. The course Instructor is a Certified Machinist and Engineering Technician.

Visit [www.ppc.ubc.ca/courses](http://www.ppc.ubc.ca/courses) for dates and registration

## Greenest City Scholars Program

Michael Coulson, a Master of Engineering Leadership in Green Bio-Products student, has been accepted in the UBC Greenest City Scholars Program. This program is a collaboration between UBC's Sustainability Initiative and the City of Vancouver to work on sustainability projects with the City in support of the Greenest City 2020 Action Plan.

The principal internship period runs from early May to mid-August each year, and students work 250 hours over the summer - internships are paid and open to all graduate students of UBC. Michael will be evaluating the use of higher blends of biofuels in the Vancouver fleets, looking into their limitations, costs and feasibility. This experience will prove to be extremely beneficial as he gains valuable knowledge that promises to enrich his academic and professional career.

For more information on the Greenest City Scholars Program, visit [sustain.ubc.ca/get-involved/students/greenest-city-scholars](http://sustain.ubc.ca/get-involved/students/greenest-city-scholars).

## Safety

With an increasing numbers of reported assaults on the UBC Vancouver campus, more Campus Blue Phones have been installed around campus, including at the main entrance of the Pulp and Paper Centre. These phones, many which are equipped with security cameras, connect with a Campus Security dispatcher and are available 24/7 for emergencies, Safety Walking, directions and assistance. Please remember to be vigilant and look out for one another - it is the best way to ensure our campus remains a safe environment for all. For those wishing to receive updates and alerts, you can sign up at [security.ubc.ca](http://security.ubc.ca)

Emilia Jahangir received the February Lab Safety Inspection award for keeping the refiner area and lab 127 neat and tidy.

PPC Emergency Procedures have been updated and posted along hallways and exits. For more information, please contact George Soong, Safety and Operations Officer.

## Tours of PPC



The Centre offers public tours throughout the year. On February 19<sup>th</sup> and March 18<sup>th</sup>, PPC staff gave tours to high school students who are considering pursuing an Engineering degree at UBC.

If you are interested in a group tour of the facilities or want to learn more about research conducted at the Centre, please contact Anna Jamroz at [anna.jamroz@ubc.ca](mailto:anna.jamroz@ubc.ca)

# GREEN BIO-PRODUCTS

## 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.

From pharmaceuticals, food packaging, clothing and building materials to cutting-edge carbon nanofibres and biofuels, a new generation of green bio-products is being developed as a viable replacement for oil-based products and fuels.

UBC has an exceptional group of researchers who are furthering the development of biomaterials from trees, including specialty paper applications, fibre- and fibril-reinforced materials, and carbon fibres from lignin. The UBC Master of Engineering Leadership (MEL) in Green Bio-Products is designed to develop highly qualified personnel with the specialized knowledge and practical experience to assume challenging roles in the rapidly evolving lignocellulosic biomass products sector.

Unique in North America, this new degree will support graduate participation in the development of advanced technical processes, product ideation and senior project management roles.

### CREATED BY THE FACULTIES OF APPLIED SCIENCE AND FORESTRY AND THE SAUDER SCHOOL OF BUSINESS

The Faculty of Applied Science at UBC is home to one of North America's premier engineering schools—UBC Engineering—bringing together 12 engineering programs. The UBC Faculty of Forestry is Canada's largest forestry school and a leader in education and research for forest conservation, forest products and natural resources.

The Sauder School of Business is one of the world's leading academic business schools and is dedicated to rigorous, relevant and experiential teaching. Together, these educational leaders collaborated closely with leading green bio-products industry members to create the UBC Master of Engineering Leadership in Green Bio-Products degree.

[mel.ubc.ca](http://mel.ubc.ca)

**MEL** | Master of  
Engineering  
Leadership



# Upcoming Events

## Vancouver Tree Week

**April 2-10**

Over a dozen tree-themed events, talks and walks will be happening all week. The event supports Vancouver's goal of planting 150,000 new trees in Vancouver by 2020. Got questions? Email [pmtree@vancouver.ca](mailto:pmtree@vancouver.ca) #VanTreeWeek

## End-of-term Centennial Celebrations

**April 6, begins at 10:30 am, outside bookstore**

An impressive, 34-foot tall post carved by Musqueam artist, Brent Sparrow Jr., will serve as a permanent welcome to all the visitors to these grounds and as a reminder of our relationship with the Musqueam people who were here long before UBC's history began. For complete program, visit [ubc100.ca/v-celebration](http://ubc100.ca/v-celebration)

## Industry Night

**April 12, 3:00-4:00pm, PPC room 101**

Join us at Industry Night to hear from Dr. Robert Gooding, Vice President, Technology at Aikawa Fiber Technologies.

## CHBE Research Seminar

**April 15, 11:00-12:00 pm, CHBE room 102**

Dr. Simcha Srebnik, Dept. of Chemical Engineering at Technion - Israel Institute of Technology will be speaking on "Molecular Modeling and Application: From Simple to Exact Models"

## PACWEST Conference

**June 8-11, Jasper, AB**

Six PPC researchers will be presenting technical papers and presentations at PACWEST. Join us to learn about their latest innovations. Program details can be found at [www.pacwestcon.net](http://www.pacwestcon.net)

## International Bioenergy Conference & Exhibition

**June 15-17, Prince George, BC**

Registration now open. You'll gain access to one of the most powerful platforms for building your business and sharing information about the biomass and bioenergy sector. Visit [bioenergyconference.org](http://bioenergyconference.org) for more info.

## PPC 30<sup>th</sup> Anniversary Open House May 28, 2016, 11:00-5:00 pm, UBC (+ Alumni Dinner, May 27, Vancouver)

Join us for a day of inspiring seminars, student poster session, interactive lab tours and demonstrations, networking, and catch up with your old friends from the Centre.

Update your contact information at:  
[ppc.info@ubc.ca](mailto:ppc.info@ubc.ca)

# Social Media



Follow us on Twitter @[ubcPPC](https://twitter.com/ubcPPC)

NEW: MEL Green Bio-Products  
@[MELgreenbio](https://twitter.com/MELgreenbio)



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Visit us online: [www.ppc.ubc.ca](http://www.ppc.ubc.ca)

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

UBC Pulp & Paper Centre @[ubcPPC](https://twitter.com/ubcPPC) 30 MAR  
West Fraser's Slave Lake Pulp Mill creates green power from #biogas  
[ow.ly/106qCC](https://ow.ly/106qCC)

UBC @UBC 7 MAR  
#UBC100 Emerging Research Workshop: Water Ways [ow.ly/Z2UKv](https://ow.ly/Z2UKv)

UBC Pulp & Paper Centre @[ubcPPC](https://twitter.com/ubcPPC) 16 FEB  
Hand tapping at our #TechnicalTraining course. Should you be here? @[ubcengineering](https://twitter.com/ubcengineering) (photo)

UBC Pulp & Paper Centre @[ubcPPC](https://twitter.com/ubcPPC) 26 JAN  
Seminar Jan. 27 at Noon in @[ubcPPC](https://twitter.com/ubcPPC) room 101 "MRV measurements at KTH: comparison to DNS and fibre suspension flow."

UBC Pulp & Paper Centre @[ubcPPC](https://twitter.com/ubcPPC) 25 JAN  
Annual API course "Intro to P&P Tech" for eng students & industry. Registration now open [ow.ly/XvGh3](https://ow.ly/XvGh3) (photo)

# 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](mailto:anna.jamroz@ubc.ca)