

# Pulp Digest

Q1 and Q2, 2017

**Celebrating Canada's 150 years.  
1867 - 2017**



*Prof. Nuwan Sella Kapu (left), Rod Stirling, Senior Scientist, and 2 MEL students Subramanian Aiyer and Ralohn Hunt absorb Tim Caldecott's discourse on wood preservation techniques at FPIInnovations. (Photo credit: Chitra Arcot)*

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- Term 1 begins this September 5

## MEL students tour FP Innovations

A cohort of students from the Master of Engineering Leadership program led by Prof. Nuwan Sella Kapu toured the labs at FPInnovations on May 31.

Program Manager Tim Caldecott and Principal Scientist Rod Stirling treated the Green Bios to a comprehensive tour of the research facilities including the Wood Products and Building Systems Labs. The Green Bios had the opportunity to gain insight into FPInnovations' activities in the entire biomass value chain ranging from wood products to advanced biomaterials and chemicals.



*Nuwan inspects the age rings in this slice of valuable hardwood.*



*The lab in which a variety of mould is allowed to proliferate and be tested. (Photos: Chitra Arcot)*

Rod Stirling, Senior Scientist, took the group into labs where wood moulds were being experimented on to create new composites of polymers and resins that prevent these moulds and thereby extend the life of wood products and of wood.

The Green BioProducts group had a first-hand peek at novel technologies for wood preservation as well as experimental tools and methods used in this field. There was a very productive discussion about the real-world applications of research and innovations efforts at FPInnovations.

## Industry Night with Dr. Trevor Stuthridge

Dr. Trevor Raymond Stuthridge holds the position of Executive Vice President at FPInnovations, with overall leadership responsibilities for R&D operations, business development and organisational strategy. Trevor has a Ph.D. in Chemistry from the University of Waikato in New Zealand plus executive qualifications in business management and governance.

Trevor's guest lecture on April 10 came at the invitation of Mark Martinez, Director of the Pulp and Paper Centre, as part of the series, Industry Nights. Trevor's slant on facilitative leadership also developed on the theme of innovations. It means staying ahead of the industry through research, optimism and risk management. Innovations involve strategic partnerships with governments and industry as no single entity can succeed alone. Trevor worked with "coalitions of the willing" in the innovation value chain, managing risks and rewards.

Trevor also serves as an Adjunct Professor at both the University of British Columbia and the University of Toronto.



*Dr. Trevor Raymond Stuthridge continued the PPC tradition of connecting industry to student research.*

## Introduction to Pulp and Paper Technology course

The 3-day course offered by the Advanced Papermaking Institute ran from April 26 to 28. Twenty-six participants came from across Canada and comprised experienced hands as well as relative newcomers in the industry, workplace safety officers and project managers.

Professors James Olson, Mark Martinez, Rodger Beatson, Peter Englezos, Nuwan Sella Kapu, Robert Barbara Dalpke and Robert Gooding (who flew over from Montreal) conducted intensive sessions and labs with the participants.

George Soong, Meaghan Miller, Emilia Jahangir and Reanna Seifert prepared lab supplies and George ran a lab on HS testing. Meaghan assisted Dr. Robert Gooding in Pilot Refiners at the High Head lab.

Calhouns Catering from Vancouver were the efficient purveyors of hot lunches and cool breaktime snacks. All participants were well tutored and well fed.

The 3-day course concluded after lab work with each participant awarded a well-earned certificate.

More pictures are on our website at:

<http://www.ppc.ubc.ca/2017/05/01/2308/>

(Photos: Chitra Arcot)



*Prof. James Olson on Types of Cells in his session about Natural Resources*

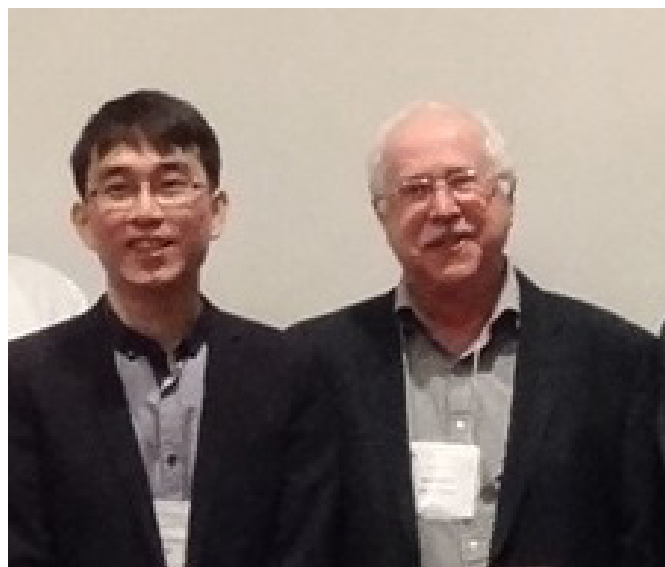


*Dr. Robert Gooding demonstrates the intricacies of Fibre Quality Analysis.*

## Zhaoyang Yuan, Applied Science's Rising Star

Zhaoyang was awarded his PhD in March this year. At the time of nomination in early April, he had six publications to his credit related to developing green and sustainable industrial processes. His research interests relate to utilizing cellulose from bamboo for novel green bio-products through a process that captures carbon dioxide

[Zhaoyang researched](#) under the supervision of professors, Dr. Rodger Beatson and Dr. Mark Martinez of the Department of Chemical and Biological Engineering. Zhaoyang was named APSC Rising Star in May 2017. Well deserved, Zhaoyang!



*Dr. Zhaoyang Yuan (left) with Dr. Rodger Beatson*

## UBC Student Session at PACWEST 2017

The annual industry conference, PACWEST, conducted its proceedings at the Fairmont Chateau Whistler from June 7 to 10. The UBC Student Session on June 9 offered delegates a vista of research from the best and brightest at UBC's Chemistry and Mechanical Engineering departments.

Six UBC graduate, doctoral and post-doctoral researchers individually presented their research and fielded questions from industry. Dr. Heather Trajano, Assistant Professor, chaired the session.

- Amir Farzad Forughi presented "Moisture Content Measurement in Paper Drying Using a Novel Technique".
- Liyang Liu introduced a green way to convert lignin in "Hydroxyethyl lignin derivatives for bioplastics".
- Sudipta Mitra explored the effect of fibre morphology in "Effect of refining of NBSK mixed with Hardwood on tensile development in PFI mill refiner".

- Varun Rangu took the green route in "Processing of pulp and paper mill waste to obtain hemicellulose and enhance properties of NBSK pulp".
- Ehsan Zaman investigated hydrodynamics in "Numerical Investigation of Cone Angle Effect on Hydrocyclone Flow Field Characteristics".
- Zhaoyang Yuan focused on a "Bio-refinery scheme to fractionate bamboo into high-grade dissolving pulp and ethanol".

Their presentations were very well received in an industry environment acutely aware of the need to be resourceful in energy consumption, the ramifications of climate change, and the fine balancing between conservation and commerce.

In addition to their presentations, Sudipta, Varun, Ehsan and Zhaoyang submitted their original research paper to a panel of judges, and Zhaoyang Yuan received the "Best Paper Award" presented at the dinner gala.



*Team UBC comprising student researchers, faculty and staff at the UBC Student Session.*



*Presenters, faculty and staff gathered to celebrate at the PACWEST dinner gala.*

## API Advisory Group Meeting

The Advanced Papermaking Institute held its Advisory Group meeting on June 26. The group met to approve the budget for 2017-18 and review its activities for the year ahead.

The group voted unanimously in favour of the proposed cost sharing structure between UBC and BCIT. The meeting was attended by: Mark Martinez – Meeting Chair; James Olson, Rodger Beatson, Shannon Huntley, Harshad Pande, Paul Bicho, George Milosevich and Tobias Ziegenbein. Peter Englezos sent his regrets in advance.

## PPC News

### Applied Science welcomes James Olson as Interim Dean

James Olson, Director of PPC, was appointed Interim Dean of the Faculty of Applied Science effective June 5. His role as Interim Dean will continue until the search for a new Dean is successful. He follows Marc Parlange who is now Provost of Monash University, Melbourne, Australia.

James holds a B.A.Sc. in Engineering Physics (1991) and a Ph.D. in Chemical Engineering from the University of British Columbia (1996). He joined UBC's Mechanical Engineering Department in July 1999 as Assistant Professor. James was appointed Director of the UBC Pulp and Paper Centre in 2011 and since early 2014, had also been serving as Associate Dean of Research and Partnerships at the Faculty of Applied Science.

His research is in the areas of advanced pulp processing, screening, LC refining, fibre and paper properties, and the fluid mechanics of fibre suspensions. He leads the UBC Forest BioProducts research cluster for innovation and novel biomaterials and biofuels.



*Dr. James A. Olson at the entrance of the Pulp and Paper Centre.*

James is a registered Professional Engineer in British Columbia. He was elected Fellow of the Pulp and Paper Technical Association (PAPTAC) recently in 2017.

"There is nothing more rewarding than solving challenging real-world problems to improve people's lives," says Olson. "This is what the applied sciences are all about, and I look forward to working with students, staff and faculty members to continue to make this happen."

*Quote excerpted from APSC This Week, June 5, 2017 issue.*

## New Faces

Please join us in welcoming some new faces to the Pulp and Paper Centre.

### Post docs contribute to research on particulate inflows

Two post-doctoral fellows from France entered the PPC portal this Spring; François Audard from Energies Nouvelles, Toulouse and Can Selcuk from Paris. Both researchers are working under the supervision of Prof. Anthony Wachs, Assistant Professor, Dept. of Math and Dept. of Chemical and Biological Engineering.



*From Left: Can Selcuk, Prof. Anthony Wachs and François Audard. (Photo credit: Chitra Arcot)*

François will be at PPC for a year and his research is a continuum of his PhD work, "Numerical Analyses of dust emission by powder discharge and jet expansion". His interests lie in fluid mechanics, multiphase flows in refinery processes and multi-scale modelling.

Can's research background is Applied Math and Computing, and for the next 2 years Can investigates high performance computing for a new class of numeric tools using Compute Canada that, when successful, will support an infinite range of industry applications from food to cosmetics and fuel to fibres.

Their research complements the projects underway with Anthony's team of post-doctoral researchers and one doctoral student.



**Alexandra Stuthridge** officially joined our ranks as Technical Business Manager in June to support Forest BioProducts Research Institute. Having worked in the forestry science sector for more than 20 years, she brings a wealth of insights of the sector as well as strong program management skills.

Amongst other initiatives, Alex will be responsible for building the FBP Institute into a globally leading research cluster at UBC in forest bioproducts.

**Chitra Arcot** stepped into the role of Communications Coordinator mid March, taking over from Anna Jamroz who is on maternity leave. Chitra's role oversees communication strategy, its implementation and organization of PPC's events.

Chitra holds a Master degree in Publishing from Oxford Brookes University, UK. She brings the marketing savvy gained from a diverse suite of organizations — a technology driven public entity, 2 NGOs and a federal public affairs division.



## Publications

### Journals

Harirforoush, Reza, Peter Wild, James A. Olson, "In-Process Detection of Fiber Cutting in Low Consistency Refining Based on Measurement of Forces on Refiner". *TAPPI Journal*. 16 no.4 (2017):189-99.

Khan, Ruhul A., Hayder J. Salem, Reza Korehei, D. Mark Martinez and James A. Olson. "Application of Fractionated Bleached Pulp Fibres on Sodium Alginate Films" *Canadian Journal of Chemical Engineering*. 95 (2017): 33-38.

Yuan, Zhaoyang, Nuwan S. Kapu, Rodger Beatson, Xue Feng Chang, and D. Mark Martinez. "Effect Of Alkaline Pre-Extraction Of Hemicelluloses And Silica On Kraft Pulping Of Bamboo (*Neosinocalamus Affinis Keng*)". *Industrial Crops and Products*. 91: (2017):66-75.

Yuan, Zhaoyang, Yangbing Wen, Nuwan Sella Kapu, Rodger Beatson, and D. Mark Martinez. "A Biorefinery Scheme to Fractionate Bamboo into High-Grade Dissolving Pulp and Ethanol". *Biotechnology For Biofuels*. 10 no.1 (2017): doi:10.1186/s13068-017-0723-2.

Yuan, Zhaoyang, Yangbing Wen, Nuwan Sella Kapu, Rodger Beatson, and D. Mark Martinez. "An Eco-friendly scheme to Eliminate Silica Problems during Bamboo Biomass Fractionation". *Nordic Pulp and Paper Resource Journal*. 32 no.1 (2017).

## Publications

Zhao, Lingfeng, Zhaoyang Yuan, Nuwan Sella Kapu, Xue Feng Chang, Rodger Beatson, Heather L. Trajano, and D. Mark Martinez. "Increasing Efficiency of Enzymatic Hemicellulose Removal from Bamboo for Production of High-Grade Dissolving Pulp". *Bioresource Technology*. 223: (2017):40-46.

## Conference Papers

Li, Keana, Pouyan Jahangiri, Nicholas A. Zacchia, Trevor Uittenbosch, Ken Buckley, D. Mark Martinez, and Cornelia Hoehr. "Modular design for a liquid target". Paper presented at National Collegiate Research Conference. Harvard, USA. January 19-21, 2017.

Mitra, Sudipta, D. Mark Martinez and James A. Olson. "Effect of refining of NBSK mixed with hardwood on tensile development in PFI mill refiner." Paper presented at PacWest Conference, Whistler, Canada, June 7-10, 2017.

Rangu, Varun, Xue Feng Chang, Rodger P. Beatson, and Heather L. Trajano. "Processing of pulp and paper mill waste to obtain hemicellulose and enhance the properties of NBSK pulp". Paper presented at PacWest Conference, Whistler, Canada, June 7-10, 2017.

Rubiano, Jorge Enrique Berna, D. Mark Martinez and James A. Olson. "Analysis of fibre shortening during low consistency refining of mechanical pulps using a comminution model". Paper presented at 10th Fundamental Mechanical Pulp Research Seminar, Jyväskylä, Finland, June 13-14, 2017.

Yuan, Zhaoyang, Yangbing Wen, and Rodger P. Beatson, "A Biorefinery Scheme to Fractionate Bamboo into High-grade Dissolving Pulp and Ethanol". Paper presented at PacWest Conference, Whistler, Canada, June 7-10, 2017.

Zaman, Ehsan, James A. Olson, and D. Mark Martinez. "Numerical Investigation of Cone Angle Effect on Hydrocyclone Flow Field Characteristics". Paper presented at PacWest Conference, Whistler, Canada, June 7-10, 2017.

Tian, Hui, Quigang Lu, R. Bhushan Gopaluni, and Victor M. Zavala, " Multi-objective Economic MPC of Mechanical Pulping Processes". Paper presented at the 55th IEEE Conference on Decision and Control, Las Vegas, USA, December 12-14, 2016.

## Presentations only

**Conference presentations only at the PacWest Conference, Whistler, Canada, June 7-10, 2017.**

Elahimehr, Ali and James A. Olson. "LC Refining of Mechanical Pulp: Understanding the Scale-up between Pilot Trials and Mill Operation".

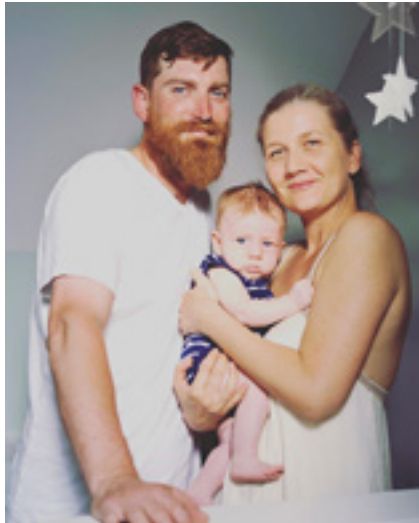
Forughi, A. Farzad, Sheldon I. Green, and Boris Stoeber. "Moisture Content Measurement in Paper Drying Using a Novel Technique".

Liyang Liu, L. N. Sathisikunoh, M. Cho, S. Chowdury and Scott Rennecker. "Hydroxyethyl lignin derivatives for bioplastics".

# Announcements

## The Stork Visited

PPC sends the new parents warm congratulations.



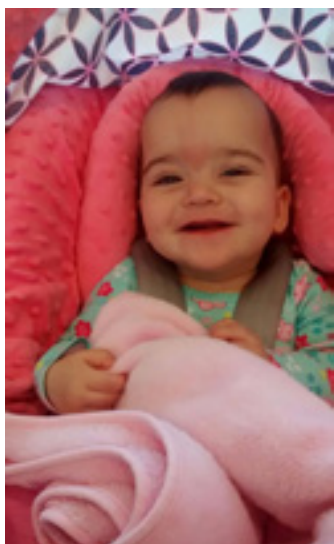
**Anna Jamroz**, Communications Coordinator at the PPC, and her husband **Matthew Postrozny** became first-time parents with the birth of their son, **Caleb Postrozny**, on April 11 in Vancouver.

**Caleb** weighed 9.5 pounds at birth and measured 60cm long.

**Sudipta Kumar Mitra**, doctoral researcher at PPC, and his wife **Debipriya Banerjee** welcomed their first child, a girl, **Ujjaini Mitra** on January 23.

A few of **Ujjaini's** birth statistics:

- Her birth weight: 7.4 pounds
- Place of birth: BC Women's Hospital, Vancouver



**Hayder Salem**, post-doctoral fellow at PPC and **Jennifer McCracken** accepted the stork's delivery of their beautiful daughter, **Elizabeth Sabiha Salem (Bee)** on September 19, 2016.

**Bee** weighed 6.1 pounds at birth.



# 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

PPC Research Steering Committee will meet on August 30 at the Pulp and Paper Centre, 2385 East Mall in UBC's Vancouver campus.

Term 1 begins on September 5. Check out [UBC's Vancouver academic calendar](#) for 2017-18.

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