



BRI has a New Strategic Plan for the Next Five Years

BRI has been working on a strategic plan for about 7 months. This plan has been completed and coincides with the publication of the strategic plan created for Lakehead University (2018-2023). Lakehead's plan is available online through the Lakehead University website and focuses on the five pillars of equity/diversity; natural resources and sustainability; internationalization of research, and the advancement of student experiences. BRI's mandate relates directly to these pillars, particularly in the areas of natural resources and sustainability, equity and diversity and internationalization of research. The plan was officially approved by the BRI External Advisory Board (EAB) at their annual meeting on October 15, 2018. Dr. Moira McPherson, Lakehead University President (see short bio below), attended BRI's EAB meeting where she emphasized the importance of the work at

Dr. McPherson, Seventh President & Vice-Chancellor of Lakehead University



Dr. McPherson officially became the seventh and first woman President & Vice-Chancellor of Lakehead University, effective September 1, 2018. Previous to her instalment as President, Dr. McPherson served as Lakehead's Provost and Vice-President Academic since 2012. She has a long history with the institution, having begun her career in 1987 as an Assistant Professor in the Department of Physical Education and Athletics, after which she became the Director of the School of Kinesiology. After seven years as Director, she was named Associate Vice-President (Academic) and Deputy Provost.

Dr. McPherson's understanding of, and commitment to, Lakehead University continues to be demonstrated through her capacity for strategic leadership, a purposeful dedication to students, and her influence on several high impact projects. Dr. McPherson holds a PhD specializing in Applied Biomechanics from the University of Alberta, and has been regularly sought out for her scholarly and professional expertise in applied kinematic and biomechanical skill analyses by both national and international organizations.



the centre and the ways in which it is becoming more vital for industry transformation. She recognized the significance of BRI's innovation in terms of research and teaching and emphasized the value of the contributions of the international students who contribute to the large body of research at the centre. BRI's strategic plan, created under the direction of Anne Ostrom, will be available for distribution in January of 2019.

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Dr. Patrice Mangin from UQTR joins the BRI EAB

Dr. Patrice Mangin from the University of Quebec in Trois-Rivières (UQTR) joined the BRI EAB. His nomination and application was unanimously approved at the EAB meeting on October 15, 2018. Patrice Mangin is Bio-economy/Bioenergy Industry Chair holder, Professor, Chemical Engineering Department at the University of Québec in Trois-Rivières (UQTR). He is the CEO of BioEnergy La Tuque (BELT) whose main objective is to build the first Canadian large scale biorefinery to convert harvest forests residues into renewable fuels (around 1 B\$ project). He is a member of the Lignocellulosic Materials Research Centre (CRML) and an Associate member of the Hydrogen Research Institute (IRH) and of the “Sustainable Development Interdisciplinary Centre” (CIRODD). He holds a Ph.D. in process engineering from Institut National Polytechnique (INP) of Grenoble and an Engineering degree from PAGORA, INP. He demonstrates an over 40 year successful track record in the pulp and paper, forest products, and printing industries. He is/has been a member of more than 30 boards of various associations and professional organizations. Among others, he was Chair of PAPTAC (Pulp and Paper Technical Association of Canada), of PAPIER, the Association

of Canadian Pulp and Paper Institutes for Education and Research, of the TAPPI International Research Management Committee (TAPPI IRMC, USA), of TAGA, the US Association for the Graphic Arts Industries, of the CEPI Research Group (Brussels), and expert FAO (Food and Agriculture Organization) of United Nations (Roma). In 2011, Patrice published the book *Once upon a Forest* to celebrate the forest as humanity’s best hope for the future. He has contributed to book chapters and has (co)authored 300+ articles and presented 600+ conferences over the world. Dr. Mangin has received many awards, including PAPTAC Gold Bates medal, 2015 UQTR Prize for Excellence in Research, PAPTAC Honorary Life Member, TAGA M.H. Bruno award (gold medal), and TAPPI W.H. Aiken Award for Excellence in Research with Significant Industry Implications. He is a PAPTAC and TAPPI Fellow.



Md Hafizur Rahman, B.Sc.

M.Sc. Student in Chemistry and Material Sciences, BRI

I started my MSc program in the Department of Chemistry and Material Sciences at Lakehead University in 2018. Before coming to Thunder Bay, I completed my B.Sc. in Chemical Engineering & Master of Engineering in Petroleum from Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh. Moreover, I spent three years in erecting, commissioning and final production in a caustic soda manufacturing plant with ion-exchange membrane technology. I also worked in natural gas exploration and production of the world class company in Chevron Bangladesh Ltd where I achieved many professional certifications on Process Safety and Lean Six Sigma. Before joining the chemical industry, I worked as research assistant in the “Development of Steam Reforming Catalyst.” Now I am working in the Biorefining Research Institute (BRI) as a research student under the supervision of Dr. Nur Alam. Currently, my research focuses on conversion of cellulose to yarn by chemical modification. I am enjoying my course work and research activities very much. Lakehead University hosts many international students, and I am one of them, which gives me another opportunity to learn about different cultures.



Welcome Tara Curtis

New BRI Administrative Assistant: Tara Curtis joined BRI in October of this year. She was a student at Lakehead before transferring to Guelph where she worked and studied for over ten years. After that, she taught English at George Brown College in Toronto before moving back to Thunder Bay in 2016. Tara looks forward to learning from the people involved in some of the most groundbreaking green technology being undertaken in Canada and is excited about returning to Lakehead University in her home town of Thunder Bay.

In the News

The Globe and Mail had an insert on September 18 of this year produced by MediaPlanet that featured many Canadian companies and organizations making a difference in the Bioeconomy. BRI Director, Dr. Lew Christopher, Canada Research Chair, Dr. Sudip Rakshit, and Vice President (Research and Innovation) Dr. Andy Dean were all featured in an article entitled, "The Biorefining Revolution Begins in Thunder Bay, Ontario." To quote Dr. Dean, "Thunder Bay may seem an unlikely place for groundbreaking biotech research, but only to those who are unfamiliar with Lakehead University." The research that is ongoing at Lakehead is indeed groundbreaking with applications that range from biofertilizers to hyper-absorbent materials such as diapers. According to Dr. Christopher, "We're not limited to any particular area of study, which is what I love about BRI. There are applications everywhere." This is emphasized by Dr. Rakshit who emphasized recycling, reuse, and reduction as well as the ways in which BRI researchers can help to eliminate fossil fuels as resources, relying instead on bioresources. "Transitioning to a renewable economy will require change at every level, and that's exactly the challenge BRI is taking on," he stated. That challenge is what motivates the researchers here at BRI and that philosophy is what puts BRI on the cutting edge of sustainable technology.



From L-R: Dr. Andy Dean, Alain Bourdages, Pascale Legase, Shrikanta Sutradhar, Dr. Nur Alam, Dr. Dmitry Tarasov, Dr. Lew Christopher, Shariful Islam

BRI Visitors

The Fall and early Winter has been a busy time with several visitors coming to the facility to see what we do at BRI. Recently, Pascal Lagase, VP Environment, Energy and Innovation and Alain Bourdages, VP Innovation and Energy at Resolute Forest Products came to see the labs and to speak with our researchers about collaboration between Resolute and Lakehead. Dr. Lew Christopher provided a summary of activities at the BRI. Drs. Nur Alam and Dmitry Tarasov demonstrated the work with which they and the BRI students are engaged.



From L-R: Shrikanta Sutradhar, Dr. Nur Alam, Dr. Dmitry Tarasov, Shariful Islam, Dr. Lew Christopher, Dr. Guillermo Gonzalez, Dr. Vasudeo Zambare

Universidad de Guadalajara in Mexico

In October, Dr. Guillermo Toriz Gonzalez from the Universidad de Guadalajara in Mexico also visited BRI to discuss collaboration between Lakehead and his university. Dr. Gonzalez does research in the use of wood, biomass, its components and agroindustrial byproducts in order to isolate, modify and characterize the polymeric components such as cellulose, hemicelluloses and lignin for the production of nanofibers and nanoparticles. The controlled release of active substances and the design of porous materials for biomedical applications and packaging are among the most important interests of his research. In addition, Dr. Gonzales is a visiting professor at the Chalmers University of Technology and a member of the Wallenberg Wood Science Center (Chalmers) in Gothenburg, Sweden.

Potential Collaboration with BRI

Chris Walton, CEO of CRIBE, visited BRI and brought with him Alex Ward, Manager of Innovation, Origin Materials, to look into potential collaborative work with BRI and investment in new biobased chemicals and materials. Production of renewable biobased materials is a good example of the type of BRI projects that would have an important impact on the environment and would be a worthwhile investment for those interested in the green economy. One such project under development at the BRI is the sustainable production of superabsorbent polymers (SAP). SAP are three-dimensional cross-linked hydrophilic, linear or branched polymers capable of absorbing and retaining liquids. Because of their excellent hydrophilic properties, high swelling capacity, and user-friendliness, superabsorbent gels have been widely used in personal care products, agriculture, biomedical applications, removal of heavy metals and drug delivery. Currently, most of the common SAP in use today are based on synthetic oil derived polymers, particularly acrylic acid and its co-polymers with acrylamide. The synthetic SAP however are not biodegradable or lack complete biodegradability. This prompted research at the BRI that has led to the development of novel cellulose-based, superabsorbing and fast-swelling



From L-R: Dr. Dmitry Tarasov, Shrikanta Sutradhar, Dr. Nur Alam, Chris Walton, Alex Ward

natural superabsorbents that can potentially compete with the synthetic SAP currently available on the market. The new hydrogels show excellent re-swelling properties, losing only 5% of their ability to re-absorb water when reused several times. Their swelling potential is comparable or higher than that of their synthetic counterparts, which makes them good candidates for applications such as high-value hygiene and biomedical products.

Events

BRI staff, students and associate members took active part in the Biomass North Forum, held Oct 16-18, 2018 at Valhalla Inn in Thunder Bay. A number of oral and poster presentations were delivered in the “Biorefining and Bioenergy” session on topics and projects that the Institute is actively involved in.

Save the Date

The BRI is pleased to announce the 2nd International Forest Biorefining Conference (IFBC) and 4th International Symposium on Lignocellulosic Materials (ISLM) that will take place on June 9 - 14, 2019 in Thunder Bay. The aim of the conference is to bring together multidisciplinary individuals and organizations from diverse sectors who are involved in research, policy, practice and business. Presenters will share local and national challenges, innovative solutions and advancements in achieving a sustainable bioeconomy. IFBC & ISLM 2019 will provide an international platform to update and critically review recent progress in all aspects of lignocellulosic research



Dr. Lew Christopher delivering a keynote address at the Biomass North Forum, October 17, 2018.

and innovation that can help advance the development of the growing Bioeconomy and bring it closer to maturation. The conference theme is: A future Bioeconomy: Cross-Sector Progress & Innovation. The main conference topics include: 1) Biomass; 2) Biorefining; 3) Biofuels; 4) Bioproducts; and 5) Bioeconomy. The joint event will be held at the Victoria Inn Hotel and Convention Centre in Thunder Bay. More details will follow, but please visit <https://ec.lakeheadu.ca/ifbc/home> for further information.

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