

## PALS is Officially Launched!

The \$6.8 million Processing Advanced Lignocellulosics (PALS) Hub was officially launched on October 26, 2018 by Managing Director of IndustryEdge and BioPRIA Trustee Foundation Chairperson, Mr Tim Woods and ARC Executive Director, Prof. Therese Jefferson. We were delighted to have Monash University Deputy Dean of Engineering, Prof. George Simon to present at the launch.

BioPRIA Director, Prof. Garnier said “this groundbreaking research will greatly help the Australian pulp, paper and forest industry transform their production waste into high-grade goods for the global marketplace. This hub will leverage world-leading Australian and international research capabilities in chemistry, materials science and engineering with the express aim of creating new materials, companies and jobs for our growing bio-economy. With ongoing support and vision from our government, industry

and university partners, we will identify new applications and products derived from bio-waste to transform the pharmaceutical, chemicals, plastics and food packaging industries in Australia and across the world.”

An industry consortium of Australian Paper, Orora, Norske Skog, Visy, Circa and Leaf will join Monash, The University of Tasmania, the University of South Australia, the Government of Tasmania and AgroParis Tech as part of this ARC Hub.



Pictured L to R: Tim Woods, Director Industry Edge (Chair, BioPRIA Trustees Committee), Professor Gil Garnier, Director BioPRIA, Monash University, Prof Therese Jefferson, ARC Executive Director, Prof George Simon, Deputy Dean, Faculty of Engineering, Monash University

## New Postgraduate Students & Staff



We welcome all new students who join us this year. They will be working in various projects across the Diagnostics research platform and the new PALS research platforms

of value chemicals and advanced materials.

Welcome aboard to Dr Christine Browne and Dr Rackel Reis, our new post-docs who will be working in Nanomaterial Science and Engineering. We would like to welcome Richie Young who started with BioPRIA early this year. Richie will manage the design and implementation of the new Master of Bio-product Manufacturing Engineering.

### Love your work...

Congratulations to **Thilina Gunawardhana** for submitting his thesis: Biorefinery Opportunities in Thermomechanical Pulping Mill. Thilina is currently employed as a Research Engineer at Orora.

We would also like to congratulate **Ruth Ledesma** for winning the best poster competition in Monash 8th CEPA Conference and **Aysu Onur** for completing her internship work at 3M, Sydney. She has been working on various projects including product development in Separation and Purification Sciences Division. She said “3M is a place to be for an engineer who seeks to apply different aspects of science in daily life.”

## BAMI Ends

After 3 years, the ARC Research Hub Bioprocessing Advance Manufacture Initiative (BAMI) has come to an end. The Hub has successfully identified nanocellulose as a key technology with practical future applications and developed the potential of catalytical green chemistry for high value chemical production.

Significant research outputs, publications and industry engagement activities have been achieved, including a patent on new technology to fill nanocellulose/paper materials with in-situ nanoparticles to control gas & water vapour permeability.

Most BAMI students have now graduated and secured employment either in the industry or university. Few remaining students are in progress of writing their thesis and are therefore in the pipeline for submission in early months of 2019.

The new Hub, PALS will continue to provide excellence in training and educational activities, whilst deliver high quality industry-relevant research.

## Research Fellow: Dr Christine Browne



I was born and raised in Melbourne, but I have recently returned from living in Grenoble, France. My background is in Chemical Engineering and Chemistry. My PhD focused on the effects of polyelectrolytes on deformable interfaces. The main techniques used were atomic force microscopy (AFM) and microfluidic devices. Since completing my PhD, my work has included understanding the effects of chemical additives on the

interactions between gypsum crystals. Prior to my PhD, I have also worked as an engineering consultant focused on the water and waste water industry.

At PALS, my role is to improve and develop various cellulose based materials of interest. I am excited about this, as I am able to use my strong fundamental knowledge in colloid and interface science and apply it to improve consumer products. I think being able to influence the production and manufacture of day to day consumer products is an exciting space to be in and means your research is important in the lives of many people.

Outside my work, I have interests in hiking, classical guitar and I'm currently back trying to improve my French!

## Conferences & Seminars Highlights



CI **Prof. Gil Garnier** and BAMI students **Llyza Mendoza**, **Jinhua Dai** and **Lionel Longe** attended *255th ACS National Meeting* in New Orleans, LA, 18-22 March 2018. This meeting provided platform for researchers to exhibit their research discoveries and technologies in Chemistry and its related disciplines. Llyza gave a presentation on "The structure-property relationship of nanocellulose gels in the Cellulose and Renewable Materials Division". Jinhua presented his work on "Depolymerisation of lignin into fine chemicals" and Lionel gave presentation and a poster on "Biodegradation of lignin and repolymerisation". The students said "the received feedback was encouraging and it provided them with confidence in the direction of their research." They used this opportunity to network with the experts to gain understanding in their field of study.

On June 11-15, The *2018 International Conference on Nanotechnology for Renewable Materials* was held together with the *Forest Products Society's 72nd International Convention* in Madison, Wisconsin, USA. CI **Assoc. Prof. Warren Batchelor** and BAMI students **Aysu Onur** and **Xue Zhang** presented their work on cellulosic nanomaterials. The conference included tour of Forest Product Laboratory and 2 workshops for Bio/Nano Technology Commercialization and Cellulose Nanomaterials Characterization Workshop.

In conjunction with Appita, BioPRIA has also held 2 industry seminars on 16th and 28th August by **visiting Prof. Angeles Blanco** and **Prof. Carlos Negro** from University Complutense of Madrid. The first seminar covered topic on integral water management and wet end optimisation, while the second seminar summarized the production and characterization of different nanocellulosic materials and their application in the recycling paper industry. With a combine attendance from academia and industry, the event provided opportunity to network and to learn about current research in the papermaking industry.

Access to presentations and video can be downloaded from BioPRIA website.

## New Instrument

BioPRIA has just purchased an Olympus OLS5000-SAF optical profilometer. This device allows the fast visualization and quantification of 3D surface features with length scales between a few centimetres and several hundred nanometers. The device uses a scanning confocal laser to capture vertical slices and then uses them to construct an interactive 3D model that can be output to a variety of formats for compatibility with other devices. This offers significant improvements over traditional microscopy.



At BioPRIA, the profilometer is used primarily to determine the surface features for micro-patterned cellulose based surface as well as determining cell distribution and configuration for bio diagnostic development.



**Important Date: PALS 1<sup>st</sup> Quarter Review Meeting for 2019 at BioPRIA, Monash University — Thursday, 28 March**