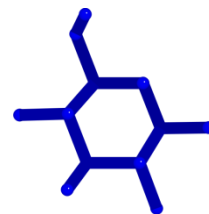


# Cellulose and Renewable Materials Division Newsletter



A Division of the American Chemical Society

## Division Officials

Chair: Sheila Murphy

Chair-Elect: Stephen Eichhorn

Secretary: Michael Santiago

Treasurer: John Simonsen

Program Chair: Chip Frazier

Program Chair Designate:  
Maren Roman

Technical Program Administrator:  
Peney Patton

Publicity Chair: Carter Fox

Awards Chair: World Nieh

Events Chair: Nicole Brown

Membership Chair: Johan Foster

Nominations Chair: Vince Edwards

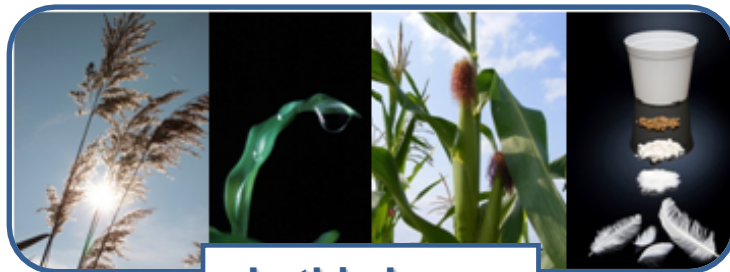
Councilors:  
Kevin Edgar  
Lucian Lucia

Alternate Councilors:  
Gordon Selling  
Tom Elder

Members-at-Large:  
Nicole Brown  
Jacob Goodrich  
Falk Liebner

Recent Past Chairs:  
Lucian Lucia  
Al French  
Orlando Rojas  
Vincent Edwards

Archivist: Vincent Edwards



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## In Memoriam

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It is with great sadness we report the death of Dr. Robert H Marchessault on September 16, 2015, the day of his 87<sup>th</sup> birthday. Professor Emeritus at McGill, Dr. Marchessault was the 1976 Anselme Payen Awardee and a well respected expert on polysaccharide chemistry. He will be greatly missed. For full details see:

<http://www.athos.ca/en/obituaries/obituaries/40074-dr-robert-h-marchessault>

## Division News

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*The Cellulose and Renewable Materials Division is adding a new Young Investigator Award to its awards portfolio. In addition, the Division's executive committee has made changes to the awards calendar for two of the Division's other awards, the Anselme Award and the Graduate Student Awards. For more details, read the following article from the Division's Awards Chair, Dr. World Nieh.*

### The New KINGFA Young Investigator Award

Awards honor the excellence of our members' accomplishments and provide the recipient with an opportunity to build up his or her resume. It also affords an excellent opportunity to publicize the recipient's achievements and our Division. As our Division grows, the Executive Committee took a critical look at our awards portfolio. The Division currently offers the prestigious Anselme Payen Award which recognizes professional contributions to the science and chemical technology of cellulose and its allied products. At the other end of the spectrum, in collaboration with Eastman Chemicals, we have the Graduate Student Award recognizing outstanding research by graduate students who will be entering the field of chemistry research for renewable materials. This leaves us with a gap and an opportunity to create the young investigator award, to recognize the work of young investigators who are establishing themselves as future leaders. In order to create the award, the Executive Committee chartered the Young Investigator Award Task Group to design, raise funds and develop procedural guidelines for the young investigator award. Members of the Task Group included Division Chair Dr. Sheila Murphy, Division Councilors Dr. Kevin Edgar and Dr. Lucian Lucia, Division Secretary Dr. Michael Santiago and Division Awards Chair Dr. World Nieh. The Task Group went to work immediately after the 2015 ACS Spring meeting with a goal of selecting the first winner in 2016 who will be honored at the 2017 Division Awards Banquet. Their efforts are coming to fruition. With the enthusiastic effort by Dr. Lucian Lucia, we were able to raise significant amount of funds from KINGFA SCI. & TECH. CO., LTD to support the award. To date, the Task Group has drafted a procedure for nomination and selection of the winner. The procedure is currently under review by the Division Executive Committee. We will post the eligibility and nomination guidelines on our Division website once they are approved by the Division Executive Committee. In the meantime, you may want to keep an eye on the exciting work of that young investigator who may be eligible for the inaugural ACS CELL Division KINGFA Young Investigator Award. Stay tuned.



World Nieh - Awards Chair

### **Changes to the Anselme Payen Award nomination deadline and winner notification schedule**

In past years, the Anselme Payen Award winner had been determined in mid to late February, and in some cases, early March. This does not give the winner and the nominator enough time to make travel arrangements to attend the Division Awards Banquet in March where the winner is announced. The short time period leading to the Awards Banquet is especially problematic for the winners and nominators who require international travel to attend the Awards Banquet. To facilitate the winner and nominator travel planning, the Executive Committee approved a new schedule for the Anselme Payen Award. Starting with the awards cycle after the 2016 Awards Banquet, the nomination deadline for the Anselme Payen Award will be on July 1. The Division Chair will inform the winner of the selection no later than October 1 and the winner will be announced at the Awards Banquet in the following year.

### **Changes to the Graduate Student Award – number of awardees and nomination deadline**

The Executive Committee also approved the following changes to the Division Graduate Student Award. The deadline for Graduate Student Award nomination has been moved from October 1 to July 1. With the new schedule, the winner will be announced no later than September 1. The schedule changes were necessary in order to meet the deadline for inclusion of the winners in the ACS Spring meeting technical program of the following year.

The Executive Committee has also approved to split the Graduate Student Award into two prizes. The first prize winner will receive a cash award of \$1500, a plaque, up to \$500 in travel expenses, an invitation to deliver an oral presentation at the ACS Spring meeting, and a complimentary Awards Banquet ticket. The second prize winner will receive a cash award of \$750, a certificate, up to \$500 in travel expenses, an invitation to deliver an oral presentation at the ACS Spring meeting, and a complimentary Awards Banquet ticket.

## **Letter from the Division Chair**

### **Chair (2015 – 2016): Sheila Murphy**

What a terrific Technical Program we had at the Spring National Meeting in Denver. My thanks to our Program Chair, Chip Frazier, all the symposium organizers, contributors and attendees who made the program such a success. Our thanks also go to the 2014 Anselme Payen Award winner, Professor Thomas Rosenau, for a wonderful organ recital in The Cathedral Basilica of Immaculate Conception that captivated the audience with his wonderful renderings of music from J.S. Bach, L. Boellmann, C. Franck and L.J.A. Lefebure-Wely.



**Sheila Murphy**

The Spring Technical National Meeting has become the highlight for the Cellulose and Renewable Materials Division. It is a place where we can share our findings, network with our community of scientists and forge new ideas for future research. At the meeting we celebrate our AP Awardee through a technical symposium and banquet. It was my pleasure to announce the winner of this year's award to Professor Akira Isogai and I look forward to the 2016 meeting where we will hold

our traditional symposium to celebrate Professor Isogai's contributions to cellulose and biopolymer chemistry, especially his pioneering work on TEMPO-mediated oxidation of polysaccharides.

During the Spring National Meeting we hold an open Business Meeting where we encourage members to participate in the development of the Division. This year, we heard our members' thoughts on topics as diverse as the length of presentations at the meeting to the need to create more networking time. We have heard your voice and seek ways to create a meeting that better serves the attending members.

Despite the success of the National Meeting, the Executive Committee is acutely aware that, of our growing membership, which now stands at nearly 2,500 members, not everyone can attend the National Meetings. We seek to hear from those members to determine how, as a technical division, we can better serve your needs. Please feel free to email me with your thoughts.

One of our recent initiatives aimed at serving our membership was to enhance the ways we recognize outstanding members of our Division. At the Denver meeting, we initiated a first and second prize for the Student Poster Award. Now, the Graduate Student Award has been updated to accommodate a first and second prize. In addition, it is with great pride and pleasure that we are about to launch a new endowed award, the KINGFA Young Investigated Award, so watch our website for further details and hear more about it at the 2016 Spring National Meeting in San Diego.

In regard to awards, I would like to reach out to all CELL members because we need to hear from you. Who do you think is worthy of a nomination for one of the CELL Awards or one of the ACS Awards? Our Awards Chair, Dr. World L.-S. Nieh, periodically reaches out to you for nominations for awards such as the Anselme Payen Award and the Graduate Student Award or solicits nominations for Divisional Fellows. As a Division we have an opportunity to submit candidates for Divisional-nominated ACS Fellows, the Kavli-sponsored Emerging Leader in Chemistry Award as well as many other ACS sponsored awards such as ACS Award in Industrial Chemistry. Who would you propose for these awards?

Many of our members undertake outreach programs, or organize symposia that seed new continuing themes within the technical program, or run conferences or workshops beyond the National Meeting program. In these cases, there is an opportunity to seek additional funding for innovative projects organized by Divisional members. An Innovative Project Grant (IPG) is awarded by Divisional Activities Committee (DAC) and designed to encourage the development and implementation of innovative projects that will strengthen the Division. Proposals must be new to the Division, stimulate Division member involvement and be a pilot for a continuing Division activity or take advantage of a unique Divisional opportunity.

I would like to thank two of our members who gave their time and energy to such innovative projects and whose efforts were rewarded by successful submissions for funding. In 2014 the CELL Division was awarded the maximum number of grants permitted in a single year. Our successful candidates were Dr. Niki Labbe to support graduate students to attend an international conference, "Frontiers in Biorefining, Chemicals & Products from Renewable Carbon," and Professor Kevin Edgar for funding towards the launch of the CELL-CARB co-sponsored symposium "Frontiers in Glycoscience, Control of Sequence and Regiochemistry". This year I am pleased to report we have two more Innovative Project Grants. Professor Kevin Edgar has been awarded an IPG for a symposium seed project entitled "New Horizons in Sustainable Materials" and Professor Lucian Lucia has been awarded an IPG for an outreach project entitled "Neighborhood Ecology Course (NEC)". If you have an

idea for an innovative project that would benefit for CELL members and the ACS, I recommend you talk to a member of the Executive Committee about the project to see if it fits the criteria for seeking an Innovate Project Grant.

While writing this letter I began to reflect over the last 10-15 years of our division. When I first joined the Division it was known as the Division of Cellulose, Paper and Textiles. The Executive Committees of those days recognized the changes occurring in industry with growth in hydrocarbon chemistry and decline in textile chemistry in the US. Membership followed industry and declined to just over 700 members. Through the Executive Committee's Leadership, and a Strategic Plan to re-invent the Division, a team set about the process of change. Keeping true to the core of our chemistry in polysaccharides but re-focusing efforts to biomaterials and renewable resources, the team successfully proposed to the ACS a name change and strategic plan to grow the Division. While change was hard in those first few years, I would like to thank all my predecessors who made this happen. The current success of the Division is due to the foresight of those leaders – thank you.



**Sheila Murphy presenting Thomas Rosenau with the 2014 Anselme Payen Award**

Through the current growth in our membership I am pleased to announce that we now have an additional seat in the ACS council, bringing us to three Council representatives. Of course, our work does not end with this current success; rather, it now becomes our challenge to continue to develop the Division to ensure that in the next 10 years the Division remains strong for our membership. If you wish to be part of this activity we need to hear from you – email, call us, or if you attend the next National meeting, join us at our Business Meeting. The Business Meeting is always held at the end of the Wednesday afternoon technical session of the Spring National Meeting, so it will take place Wednesday March 16, 2016 in San Diego. All members are welcome and I encourage you to join us. This is the meeting where the Executive Committee can share with you our update for the year and hear from you about your thoughts, concerns or opportunities for the future.

Finally, should you be interested, the Division name change mentioned above was not the first in our history. For those interested to see how our Division has changed since it was founded in 1920, please go to the CELL Division website under the organization tab where you will find our history. (<http://cell.sites.acs.org/history.htm>) Also note, in 5 years time we will be celebrating our centennial anniversary. How would you like the Division to celebrate this anniversary?

## Division Awards

### 2015 Anselme Payen Award

Professor Akira Isogai has been named the 2015 Anselme Payen Award winner. He will be presented with his award during next year's Anselme Payen award banquet at the 251st ACS National Meeting & Exposition in San Diego.

Dr. Isogai received his Ph.D. from the University of Tokyo under the direction of Professor Junzo Nakano (1990 Anselme Payen Award recipient) and co-advisor Professor A. Ishizu. After completing his Ph.D., he joined the Institute of Paper Chemistry as a post-doctoral fellow working under Dr. Rajai Atalla (1998 Anselme Payen Award recipient). Following his post-doctoral fellowship he accepted an Assistant Professor appointment at the University of Tokyo. He later returned to the U.S. as a Visiting Scientist at the U.S. Forest Service Forest Products Laboratory working with Dr. Atalla. Dr. Isogai has held positions of increasing responsibility at the University of Tokyo and has been called upon multiple times to advise the President and other senior academic staffs. Dr. Isogai is currently a professor at the University of Tokyo, Department of Biomaterials Science and heads its Biomaterials and Cellulose Science Laboratory.



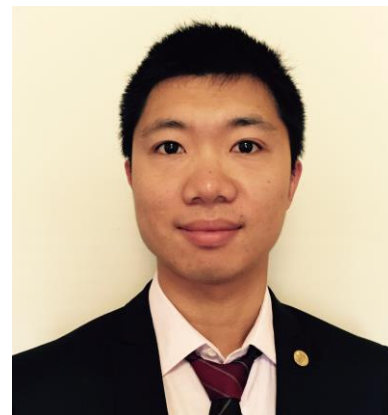
Akira Isogai

Dr. Isogai has made great contributions in many fields of cellulose and biopolymer chemistry. His pioneer work on TEMPO-mediated oxidation of polysaccharides was originally developed to solubilize cellulose in aqueous media. He later deployed this expertise of TEMPO-mediated oxidation of polysaccharides in his work on cellulose nanofibrils. Because TEMPO oxidized cellulose nanofibrils have uniform width (~3 nm), high aspect ratios and can be prepared in aqueous conditions with reduced energy intensity, their application has been widely studied countries around world including many European countries, USA, China and Japan. TEMPO oxidized cellulose nanofibrils films are transparent with excellent oxygen barrier properties. They have great application potential in transparent biobased packaging material that can extend the shelf life of foods and medicines. Dr. Isogai's many other contributions in cellulose and polysaccharide chemistry include preparation and characterization of highly substituted cellulose ethers (DS~3), clarifying the influence of structural changes of disordered regions on properties of cellulosic materials under various humidity conditions, preparation and characterization of cellulose-chitin composite films, determination of wet-end additives in paper and their retention, dissolution mechanism of cellulose in aqueous NaOH solution and the development of an environmentally-friendly aqueous alkali-urea solvent system to regenerated cellulose fibers and films, SEC-MALLS studies that have determined some of the softwood cellulose has branched structures whereas cellulose from some other organisms exhibit linear and random-coil conformations in LiCl-DMI solvent.

Dr. Isogai has 306 peer-reviewed scientific publications in chemistry of polysaccharide, cellulose, paper, wood, biomaterials and other topics. His publications have been cited 5561 times. Dr. Isogai and collaborators have 86 patent applications. Dr. Isogai has reviewed a total of 149 articles, books and book chapters.

## **Graduate Student Awards**

Xiangtao Meng, a fourth-year Ph.D. student from Virginia Tech, is the first place winner of the 2016 ACS CELL Division Graduate Student Award. Working under the supervision of Dr. Kevin Edgar, Xiangtao's work focuses on double bond related chemistries including olefin cross-metathesis, Michael addition and hydroboration-oxidation reactions in cellulose functionalization for drug delivery and other applications. He has four published manuscripts, a fifth one under review and other manuscripts in preparation. He is a co-inventor of 21 Chinese patent applications (12 granted) and 3 U.S. patent applications. Xiangtao is currently completing an internship with SABIC Innovative Plastics this summer.



**Xiangtao Meng**



**Stephen Spinella**

The second place winner of the 2016 ACS CELL Division Graduate Award is Stephen Spinella. Stephen is also a fourth-year Ph.D. student pursuing a dual doctoral degree in polymer science between New York University and the Université de Mons in Belgium. He started his Ph.D. studies in 2011 at NYU under the supervision of Dr. Richard Gross. In 2012 he started an ongoing collaboration with the Université de Mons under the supervision of Dr. Philippe Dubois and Dr. Jean-Marie Raquez. His research interests include the modification of polysaccharide nanocrystals, polymer nanocomposites, polymer blends, reactive extrusion, enzyme catalyzed polymerizations and bio-based materials. To date, he has authored three first-author papers and two second-author papers.

The Cellulose and Renewable Materials Division of the American Chemical Society, in collaboration with the Eastman Chemical Company, recognizes graduate student achievements in cellulose and renewable materials research. The first place winner of the Graduate Student Award will receive a check for \$1,500, up to \$500 for travel expenses, and a plaque in recognition of his accomplishments. The second place winner will receive a check for \$750, up to \$500 for travel expenses and a certificate recognizing his accomplishments. Both winners are invited to attend the ACS Spring National Meeting in 2016 and deliver an oral presentation.

## EPNOE and CELL

*The European Polysaccharide Network of Excellence (EPNOE) and the Cellulose and Renewable Materials Division of the ACS have enjoyed a close relationship for many years, with EPNOE co-organizing symposia within the CELL Division's program at ACS meetings. This year, many members of the CELL Division are active in organizing and promoting the 4<sup>th</sup> EPNOE International Polysaccharide Conference to take place in Warsaw, Poland. To mark the occasion, the Fibril Angle asked Patrick Navard and Pedro Fardim, President and Vice-President of EPNOE, to help our division members better understand the EPNOE mission and the relationship between EPNOE and CELL.*

### European Polysaccharide Network of Excellence and ACS: A long history of collaboration

*Patrick Navard  
President of EPNOE  
Mines ParisTech / CNRS, France*

*Pedro Fardim  
Vice President of EPNOE  
Åbo Akademi, Finland*

In 2002, the European Commission launched a manifestation of interest for creating networks in Europe. Several academic and industrial partners built a first consortium and submitted a network on cellulose called Cellnet. Considered too narrow by the European Commission, it was extended to polysaccharides. In 2003, the "Polysaccharides" proposal was submitted as a Network of Excellence, with 16 partners. A Network of Excellence was a novel type of virtual research organization at the level of the 25 countries of the European Union that was implemented by the European Commission. According to its definition, its purpose was to strengthen excellence on a particular research topic by networking together the critical mass of resources and expertise needed to be world force in that topic. "Polysaccharides", very quickly called EPNOE for European Polysaccharide Network of Excellence, was ranked first among many proposals and was accepted for funding. In 2007, the EPNOE network became a non-profit organization called EPNOE Association.

EPNOE is a research, education and knowledge transfer network connecting companies, academic and research institutions working or interested in polysaccharides. Its main missions are (1) to offer a networking platform enabling close interactions between members in order to favour innovation, boost knowledge transfer and organize R&D activities in a totally confidential manner, (2) to



Patrick Navard



Pedro Fardim



organize basic and applied research for the study of fundamental concepts, the testing of new ideas and the development of new products based on or containing polysaccharides and (3) to organize education in polysaccharide science at the level of continuing education for companies and of post-graduate students and post-docs.

The legal body under which the EPNOE network is acting is called EPNOE Association. It is a non-profit institution registered in France (association loi 1901). Members can only be legal, registered bodies. Activities are only financed by membership fees. EPNOE Association has three types of members:

- Regular members, any type of legal organization except companies. They have management duties.
- Business and Industry Club (BIC) members, only composed of companies, using the services of EPNOE and interacting among themselves and with Regular members.
- Affiliated members, any type of legal organization except companies. They will have no management responsibility and no obligation to attend General Assembly or Boards. They are associated to all EPNOE activities.

EPNOE Association is managed by a Governing Board and an Executive Board. Its annual General Assembly is taking the main decisions. At the present time, Armines in France (represented by Patrick Navard) is President of EPNOE Association. Its four vice-Presidents are Abo Akademi in Finland (represented by Pedro Fardim), the university of Maribor in Slovenia (represented by Karin Stana-Kleinschek), the university of Wageningen (represented by Jan van Dam) and the Institute of Biopolymers and Chemical Fibres in Poland (represented by Danuta Ciechańska). These five members constitute the Executive Board. The 40 present EPNOE members are conducting their activities in most of the areas where polysaccharides or polysaccharide-based chemicals and products are used.

EPNOE members are sharing information and knowledge by educating PhD's within EPNOE institutions, sharing the expertise present within EPNOE community, and creating databases and a tool box (equipment present and available in EPNOE member's institutions). They are performing together activities like developing new research projects and building research, development and innovation projects in a fully confidential manner (more than 300 such contracts with companies are running every year). Brain-storming session and face-to-face meetings are regularly organized. For this last activity, the challenge is to organize in an efficient, not too-consuming-time and profitable manner the building of links between scientists who do not know each other and are working in related, but different fields. We tried three different ways, all with their own advantages and drawbacks. Collective brain-storming sessions are fun, and they often lead to opening new paths with building of new projects. But the difficulty is to build an "area of trustworthiness" where participants are feeling free to speak. We are planning to restart such exercises beginning of 2016. The Dormant Idea initiative was even more complicated to implement, but out of ten "lost" ideas came one real project, which is a big success. EPNOE members are requesting to start again this initiative, probably also beginning of 2016. A description of the Dormant Ideas initiative can be found in the March 24, 2013, issue of the EPNOE Newsletter, freely available on the EPNOE website ([www.epnoe.eu](http://www.epnoe.eu)). A third method used by EPNOE is the organization of face-to-face meetings. Here confidentiality is easily ensured but the difficulty is to find a way to match the interests of participants, a task which must be conducted well in advance of the meeting. We performed such an exercise in July 2015 in Paris. In the August 2015 issue of the EPOE Newsletter, participants are giving their feelings about this face-to-face meeting.

EPNOE is building links with other stakeholders like the Bioeconomy Cluster in Germany, Polintegra in Poland and Céréales Vallée in France. It is an associate member to the Bio-based Industries Consortium and to the Bio-based Industries Initiative.

### Links with the American Chemical Society

Links with the EPNOE and the CELL division of ACS are old. For many years, scientists belonging to EPNOE network organized and participated to ACS activities. However, the first time EPNOE organized in its name a symposium in ACS meetings was in New Orleans in 2008. The topic was about the views of USA and Europe on the ways to handle the development of biobased polymers. Since then, at all the ACS meetings where the CELL division was present, EPNOE scientists have been organizing symposia. This will be the case for the Spring 2016 National Meeting in San Diego with two sessions co-organised by EPNOE (New Horizons in Sustainable Materials and Functional Lignocellulosics & Nanotechnology). A further move was the proposal by EPNOE that the EPNOE conferences organized every two years would be under the joint auspices of EPNOE and ACS. This started in 2013 for the EPNOE conference organized in Nice, France, and will continue in 2015 for the one which will be held in Warsaw, Poland.

EPNOE is strongly willing to increase all possible interactions with ACS, for the benefit to their respective members.

### Upcoming Conferences

#### **EPNOE International Polysaccharide Conference**, October 18 – 22, 2015

Warsaw, Poland

Website: <http://epnoe2015.ibwch.lodz.pl>

#### **International Paper Physics Conference and 9<sup>th</sup> International Paper and Coating Chemistry Symposium**, October 29 – November 1, 2015

Tokyo, Japan

Website: [http://biz.knt.co.jp/tour/IPCCS\\_IPPC2015](http://biz.knt.co.jp/tour/IPCCS_IPPC2015)

#### **Pacifichem**, December 15 – 20, 2015

Honolulu, HI

Website: <http://www.pacifichem.org>

#### **251<sup>st</sup> American Chemical Society National Meeting & Exposition**, March 13 – 17, 2016

San Diego, CA

Website: <http://www.acs.org/content/acs/en/meetings/san-diego---spring-2016.html>

#### **International Carbohydrate Symposium**, July 17 – 22, 2016

New Orleans, LA

Website: <http://ics.sites.acs.org>

## 2016 Spring ACS National Meeting

### Cellulose and Renewable Materials Division Technical Symposia

Program Chair: Chip Frazier, [cfrazier@vt.edu](mailto:cfrazier@vt.edu)

Abstract submission deadline: **October 12, 2015**

Please submit abstracts to the CELL Division at <http://maps.acs.org>. Inquiries should be directed to the symposium organizers or program chair.

### **Biomass and Polymer Extrusion, Composite, and Reaction Technologies: New Insights, Future Potential, and Principles to Practice**

Organizers: Ali Ayoub, [aayoub@ncsu.edu](mailto:aayoub@ncsu.edu); Lucian Lucia, [lucianlucia@163.com](mailto:lucianlucia@163.com)

Co-sponsorships: POLY, PMSE

Reactive extrusion is an attractive green route for cost-effective polymer chemistry and processing with the potential to enhance the commercial viability of biomass-derived and other polymeric materials. The primary focus of this symposium is to find balance between the principles and the practices to offer attractive opportunities for developing new systems with unique properties from composites, carbon fiber, bioenergy to food sciences. Attention to rheology and modeling of reactive systems and advanced characterizations to ultimately achieve commercial success will be considered.

### **Biomedical and Drug Delivery Applications of Polysaccharide-Based Materials**

Organizers: Maren Roman, [mgrunert@vt.edu](mailto:mgrunert@vt.edu); Vince Edwards, [Vince.Edwards@ars.usda.gov](mailto:Vince.Edwards@ars.usda.gov)

Polysaccharide-based materials are widely used in medicine and many new applications are being investigated, often involving blood contact and wound healing. The primary focus of this symposium is blood-contacting and wound healing properties and applications of polysaccharides. Papers on other biomedical and drug delivery applications will also be accepted.

### **Cellulose nanocomposites processing development and their structure property relations**

Organizers: Kristiina Oksman, [Kristiina.oksman@ltu.se](mailto:Kristiina.oksman@ltu.se); Mohini Sain, [M.Sain@utoronto.ca](mailto:M.Sain@utoronto.ca)

Ten years after the first ACS symposium on cellulose nanocomposites, this symposium considers developments in nanocomposites processing including compounding, film extrusion, resin impregnation, (electro-) spinning, casting, foaming, sol-gel, molding, freeze drying, dissolving, as well as nanocomposites structure-property relations including nanofibers orientation, dispersion, distribution, size, and interfacial phenomena, all as related to properties.

(Continued)

**Cellulose Nanocrystal Fundamentals**

Organizers: Eero Kontturi, [eero.kontturi@aalto.fi](mailto:eero.kontturi@aalto.fi); Emily Cranston, [ecranst@mcmaster.ca](mailto:ecranst@mcmaster.ca); Tekla Tammelin, [tekla.tammelin@vtt.fi](mailto:tekla.tammelin@vtt.fi)

The symposium focuses on research involved with cellulose nanocrystals, including preparation, characterization, modification, dispersions, and surface interactions among others with the strong emphasis on fundamental aspects.

**Economic aspects of biofuels**

Organizers: Michael Ioelovich, [bd895892@zahav.net.il](mailto:bd895892@zahav.net.il)

Purpose is a calculation of production cost and energy cost of various biofuels made of plant biomass: solid (biochar, pellets), liquid (bioalcohol, biodiesel, biooil) and gaseous (biogas) and in comparison with costs of solid, liquid and gaseous fossil fuels.

**Functional Lignocellulosics and Nanotechnology**

Organizers: Tiina Nypelö, [tiina.nypeloe@boku.ac.at](mailto:tiina.nypeloe@boku.ac.at); Soledad Peresin, [soledad.peresin@vtt.fi](mailto:soledad.peresin@vtt.fi); Erkko Filpponen, [erkko.filpponen@aalto.fi](mailto:erkko.filpponen@aalto.fi); Stefan Spirk, [stefan.spirk@tugraz.at](mailto:stefan.spirk@tugraz.at)  
Co-sponsorship: EPNOE

The symposium will be organized under the following topics: 1) Functional lignocellulosics, including responsive materials, 2) surface interactions on ligno-nanocellulosic materials, 3) dispersions, gels, foams, colloids, films, 4) cellulose nanomaterials and their applications, and 5) lignocellulosic hybrid materials. Authors are advised to indicate the preferred subtopic upon submission.

**Improved utilization of proteinaceous materials**

Organizers: Gordon Selling, [Gordon.selling@ars.usda.gov](mailto:Gordon.selling@ars.usda.gov)

Current research on all facets of the utilization of proteinaceous materials, including isolation, characterization, chemical/physical modification, and conversion to valued products.

**Lignin Refining, Functionalization & Utilization**

Organizers: Dimitris S. Argyropoulos, [Dsargyro@ncsu.edu](mailto:Dsargyro@ncsu.edu); Claudia Crestini, [Crestini@stc.uniroma2.it](mailto:Crestini@stc.uniroma2.it)

Modern bio refineries and traditional pulp mills alike need value added lignin streams. The potential of lignin for such applications can be realized via refining and functionalization. This symposium intends to bring together academic and industrial researchers to disseminate and converse on: New & Traditional Technical Lignin Streams; Lignin Fractionation & Refining Efforts; Novel Lignin Functionalization Schemes; Lignin Structure-Property Relations; Emerging Applications. The symposium is envisaged to nucleate the emergence of an ACS series Book entitled; Lignin Refining, Functionalization & Utilization.

*(Continued)*

**New Horizons in Sustainable Materials**

Organizers: Kevin Edgar, [kjedgar@vt.edu](mailto:kjedgar@vt.edu); Patrick Navard, [patrick.navard@mines-paristech.fr](mailto:patrick.navard@mines-paristech.fr)

Co-organizer: EPNOE

Co-sponsorships: POLY, EPNOE

Sustainable materials are of growing importance to society for environmental, security, and quality of life reasons. In this symposium we highlight the contributions to solutions in high performance sustainable materials by outstanding early career investigators in the field. The symposium is also a kickoff for the new Young Investigator Award from CELL, sponsored by KINGFA Industries, that will enter the first award cycle in the spring.

**The Structure of Native Celluloses and the Variety of Nano-celluloses that can Be Formed From Them: Anselme Payen Award Symposium in Honor of Akira Isogai**

Organizers: Rajai Atalla, [rhatalla@wisc.edu](mailto:rhatalla@wisc.edu); Junji Sugiyama, [sugiyama@rish.kyoto-u.ac.jp](mailto:sugiyama@rish.kyoto-u.ac.jp); Umesh Agarwal, [uagarwal@fs.fed.us](mailto:uagarwal@fs.fed.us); Orlando Rojas, [orlando.rojas@aalto.fi](mailto:orlando.rojas@aalto.fi)

Celluloses occur in a wide variety of native states that differ in molecular organization and that are modified during isolation in most instances. Their transformations into nano-celluloses are influenced to varying degrees by source and history. The symposium is open to presentations that add to understanding nano-celluloses and their properties and to the influences of source and pretreatment histories.

**Valorization of Renewable Resources and Residuals into New Materials and Multiphase Systems**

Organizers: Maria Auad, [auad@auburn.edu](mailto:auad@auburn.edu); Denise Petri, [dfsp@usp.br](mailto:dfsp@usp.br); Jose Campos, [icampos@correo.cua.uam.mx](mailto:icampos@correo.cua.uam.mx); Omar El Seoud, [elseoud.usp@gmail.com](mailto:elseoud.usp@gmail.com); Orlando Rojas, [orlando.rojas@aalto.fi](mailto:orlando.rojas@aalto.fi)

This symposium will consider contributions in the area of valorization of residual lignocellulose, agricultural and other biobased materials (biomass processing by-products, wastes and side-streams, etc.) to develop new materials (fibers, composites, films, coatings, particles, etc.). Expanding the property space of cellulose, lignin, hemicelluloses, lignin, chitosan and proteins are at the center of the discussion in this symposium.

**Water Treatment and Remediation Technologies Derived from Green Materials**

Organizers: Ali Ayoub, [aayoub@ncsu.edu](mailto:aayoub@ncsu.edu); Lucian Lucia, [lucianlucia@163.com](mailto:lucianlucia@163.com)

Co-sponsorships: ENVIR

Limitations of clean water are on everyone's radar as a massive global human health threat. In this symposium, we will examine and discuss the approach of using biomass and related polymers as new materials with emphasis on their potential use for treating water contamination from heavy metal and other types of pollution.

**General Posters**

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