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» Interactive solvent selection tool coming soon!

TALK TO A ROUNDTABLE REPRESENTATIVE TODAY  
Call 202.872.6102 or email gcipr@acs.org
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Welcome to the 21st Annual Green Chemistry & Engineering (GC&E) Conference! This conference is about coming together to reimagine chemistry and engineering for a sustainable future.

Green chemistry and engineering is an innovation and design-driven approach to chemistry and chemical processes that seeks to reduce waste, conserve energy and discover replacements for hazardous substances and nonrenewable raw materials throughout the life cycle of a product. We believe that such innovation is key to solving many environmental and human health challenges that plague our world today and is also a driver of economic value.

The GC&E Conference provides a unique platform for leaders, policy makers, educators, students and professionals from the scientific community to obtain valuable knowledge of the latest green chemistry and engineering research and to establish meaningful collaborations and networks. This year’s theme, Making Our Way to a Sustainable Tomorrow, is the second in a quartet of themes focusing on each phase of the chemistry life cycle: Design, make, use and closing the loop.

Thank you for bringing your enthusiasm, passion and expertise to this conference. It is with your continued support that we can further the development of effective solutions and accomplish our mission—to catalyze and enable the implementation of green chemistry and engineering throughout the global chemistry enterprise.

FOLLOW GC&E CONFERENCE POSTS BY JOINING US ON:
facebook.com/ACSGreenChemistryInstitute
linkedin.com/in/acsgci
twitter.com/acsgci [@ACSGCI]

Conference Hashtag: #gcande

ACS GCI helps keep the GC&E Conference green by offsetting 100 tons of CO₂ and printing on FSC certified paper.
Welcome

On behalf of the 21st Annual Green Chemistry & Engineering Conference advisory committee, welcome to Reston, Virginia! This year’s theme, *Making Our Way to a Sustainable Tomorrow*, reflects our desire to promote innovative developments and practical ways to create a more sustainable world. It is guaranteed to motivate and challenge attendees to propel green chemistry and engineering to the next level.

With three days of dynamic programming—comprised of keynote addresses from world-renowned scientific leaders, 42 informative and interactive technical sessions, insightful poster sessions and several targeted workshops—we are certain that this Conference will be the greatest yet.

We are excited by the return of the GreenX plenary featuring concise, creative and inspirational talks. This year’s edition highlights early-career women who are making outstanding contributions to the field of green chemistry and engineering. Be sure to join us on Tuesday, June 13 at 4:45 p.m. for this feature event.

Also, back by popular demand, is the NextGen GreenChem Workshop (formerly the student workshop). This year we have planned a full day packed with opportunities for students and post-doctoral scholars to partake in a combination of professional development training as well as explore the application of green chemistry to solve real-world problems.

Once again we look forward to hosting the American Chemical Society (ACS) Careers Workshop. New to this year’s workshop is the presentation of ChemiDP™, ACS’s professional development tool. The workshop will provide attendees with invaluable insights and practical tools on setting clear goals toward their desired career path.

We’ve worked diligently to bring you an outstanding conference and sincerely thank you for your continued partnership and collaboration throughout the last 21 years. We look forward to a most memorable conference that will have a lasting positive impact on everyone in attendance.

Lastly, we would like to give a special thank you to our sponsors and exhibitors, whose generous support help to make this event possible.

Sincerely,
David Leahy, Ph.D.,
*Principal Scientist*, Bristol-Myers Squibb

Amit Sehgal, Ph.D.,
*R&I Project Manager & Sustainable Chemistry Lead*, Solvay
Welcome Letter From the ACS President

Dear ACS Green Chemistry & Engineering Conference attendees:

As President of the American Chemical Society, it is my pleasure to extend a warm welcome to the attendees of the 21st Annual Green Chemistry and Engineering Conference (GC&E) in Reston, VA.

Each year, the ACS Green Chemistry Institute® (ACS GCI) works diligently to organize one of the premier conferences within the scientific community, and this year is no different. The robust program highlights our achievements as practitioners of chemistry in our effort to continually innovate and advance the science while safeguarding human health and the environment.

I am excited that you are taking this wonderful opportunity to convene with other green chemistry and engineering scientists to share advances in research and education and establish new collaborations. I am confident that this conference will be a highly beneficial networking and learning experience.

In addition to informative programming, this year’s conference will also present the GreenX: Rising Stars event, which will highlight early-career women who are making outstanding contributions to the fields of green chemistry and engineering.

I am delighted to lend my support to ACS GCI in its successful efforts to advocate for green chemistry within academia, industry and government. Together, we can continue to make a difference and positively impact the global development of a more sustainable future.

Sincerely,

Allison A. Campbell, Ph.D.
2017 President
American Chemical Society
Welcome Letter from the ACS Executive Director & CEO

As Executive Director and CEO of the American Chemical Society, I’m delighted to welcome each of you to the 21st Annual Green Chemistry and Engineering (GC&E) Conference.

The GC&E conference consistently offers insightful information that is highly relevant to the chemical industry. This year’s theme is Making Our Way to a Sustainable Tomorrow, and the conference will focus on highlighting innovation that will yield the most valuable results for a safer and brighter future.

The conference delivers three dynamic days of programming to include thought-provoking keynote addresses, interactive technical and poster sessions, and several targeted workshops designed to provide insightful and practical tools to aid in the global advancement of a more sustainable future.

I am pleased to support the ACS Green Chemistry Institute® and its continued efforts to convene and engage green chemistry and engineering practitioners. This year’s conference is guaranteed to be a tremendous success. Again, welcome and thank you for your attendance and ongoing support. I look forward to seeing you during the course of the conference.

Sincerely yours,

Tom Connelly, Ph.D.
Executive Director & CEO
American Chemical Society
2017 Conference Advisory Committee

COMMITTEE CHAIRS

David Leahy, Ph.D.
Principal Scientist
Bristol-Myers Squibb

Amit Sehgal, Ph.D.
R&I Project Manager & Sustainable Chemistry Lead, Home & Personal Care
Solvay

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Director, Center for Green Chemistry & Green Engineering;
Teresa and H. John Heinz III Professor in the Practice of Chemistry for the Environment
Yale University

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University of Pittsburgh

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Adjunct Professor, Department of Chemistry
Indiana University

John Frazier
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Assistant Department Head and Senior Instructor,
Department of Chemistry and Biochemistry
University of Oregon
Jim Hutchison, Ph.D.
Professor, Lokey-Harrington Chair in Chemistry
University of Oregon

Marty Spitzer, Ph.D.
Director, US Climate and Renewable Energy Policy
World Wildlife Fund, US

Adelina Voutchkova-Kostal, Ph.D.
Assistant Professor of Chemistry
George Washington University

Walter Leitner, Ph.D.
Chair of Technical Chemistry and Petrochemistry, Institute for
Technical Chemistry and Macromolecular Chemistry (ITMC)
RWTH Aachen University

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Sharon Papke, Covestro LLC
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Daniel Pedersen, Ph.D., Green Seal

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Amit Sehgal, Ph.D., Solvay
Longzhu Shen, Ph.D., Yale University
Brian Sparling, Ph.D., Amgen
Joseph Stanzione, Ph.D., Rowan University
Bala Subramaniam, Ph.D., University of Kansas
Paul Thornton, Ph.D., GreenCentre Canada
Saskia van Bergen, Washington State Department of Ecology
Adelina Voutchkova-Kostal, Ph.D., George Washington University
John Warner, Ph.D., The Warner Babcock Institute for Green Chemistry
Jeffrey Whitford, MilliporeSigma
David Widawsky, Ph.D., U.S. EPA
Jane Wissinger, Ph.D., University of Minnesota
CONFERENCE ADMINISTRATORS AND VOLUNTEERS
The conference is hosted by the ACS Green Chemistry Institute®

Mary Kirchhoff, Ph.D., Executive Vice President of Scientific Advancement and Acting Director of ACS GCI
David Constable, Ph.D., Science Director
Isamir Martinez, Ph.D., PMP, Program Manager
Jenny MacKellar, Program Manager
Christiana Briddell, Communications & Outreach Manager
Somalia Alsobrooks, Senior Office Administrator

We extend a special thank you to our conference administrators.

Patti Berkes               Dawn Holt, Ph.D.
Cheryl Carter             Lara Kadylak
Susan Castro              Natasha Roque
Jane Day                  Graham Tiller
Matt Deinhardt

Also, a big thank you to ACS employees and contractors who have worked to help us attain this level of success: Yvonne Dudley, Erkan Ertekin, Robin Green, Vanessa Evans-Johnson, Lauren Lamoureux, Ellen Mayo, Amanda Morris, Farai Tsokodyai and Lauren Winstel. In addition, we thank our onsite volunteers who’ve dedicated their time to help make this conference a success. We couldn’t do it without you!

CONFERENCE BADGE POLICY
Conference-issued name badges must be worn at all times during the conference. You can print your badge at the registration desk. If you lose your badge, please return to the conference registration desk to request a replacement badge. The fee for replacing your badge is $50.00 (payable by credit card only).
Keynote Speakers

Jillian Buriak, Ph.D.
Editor-in-Chief, Chemistry of Materials;
Professor of Chemistry, Canada Research Chair of Nanomaterials for Energy
University of Alberta

Paul Chirik, Ph.D.
Editor-in-Chief, Organometallics;
Edward S. Sanford Professor of Chemistry
Princeton University

William Feehery, Ph.D.
President
DuPont Industrial Biosciences

GreenX: Rising Stars
Tuesday, June 13, 2017, 4:45–6:15 p.m.
Grand Ballroom A-D

The GreenX plenary features concise, creative and inspirational talks. This year’s edition will highlight early-career women who are making outstanding contributions to the fields of green chemistry and engineering. After careful consideration of our group of standout nominees, three exemplary women have been selected to be honorary speakers:

Jillian Goldfarb, Ph.D., Assistant Professor of Mechanical Engineering, Boston University

Corinna Schindler, Ph.D., Assistant Professor of Chemistry, University of Michigan

Adelina Voutchkova-Kostal, Ph.D., Assistant Professor of Chemistry, George Washington University

The session will be moderated by keynote speaker Jillian Buriak, Ph.D., Professor of Chemistry, University of Alberta.
2017 Highlights & Events

WELCOME RECEPTION
Tuesday, June 13, 2017, 6:15 – 8 p.m.
Regency Ballroom

Join us for hors d’oeuvres, drinks and networking at our opening night reception. All conference registrants and ticketed guests are welcome.

POSTER SESSION & RECEPTION
Wednesday, June 14, 2017, 4:35 – 6:35 p.m.
Grand Ballroom E-G

Stop by our “must attend” poster session to talk to presenters about their research while enjoying beer, wine and light snacks with your colleagues. The GC&E poster session is held in two parts: even numbers present from 4:35-5:35 p.m. and odd numbers from 5:35-6:35 p.m. Judges will evaluate student posters. Prizes will be awarded to the top student posters on Thursday morning. See page 23 for a complete poster listing.

Student Poster Chair:
Richard Blackburn, Ph.D., University of Leeds

7TH ANNUAL ACS GCI INDUSTRIAL ROUNDTABLE POSTER RECEPTION
Wednesday, June 14, 2017, 6:45 – 9 p.m.
Regency Ballroom
By invitation only

The ACS GCI Industrial Roundtables will host an industry-focused poster reception on Wednesday evening. Invited guests will network and share information that propels innovation for sustainable and green processes and products across chemical manufacturing, formulated products, pharmaceuticals and other industrial areas.

NEXTGEN GREENCHEM WORKSHOP
Making Green Chemistry Work for You
Monday, June 12, 2017, 8 a.m. – 5 p.m.
Regency Ballroom

The 2017 NextGen GreenChem workshop (formerly Student Workshop) is a unique opportunity for undergraduate and graduate students as well as post-doctoral scholars to partake in a combination of professional development opportunities and a green chemistry process design challenge. This year, the focus of the workshop will be two-fold. The first part of the workshop taps into a new paradigm in science—the ability to communicate your research
effectively to a variety of audiences. The second part of the workshop is a unique opportunity for undergraduate and graduate students as well as post-doctoral scholars to explore real-world applications of green chemistry.

**TOXICOLOGY FOR CHEMISTS WORKSHOP**

*Successful examples for integrating toxicology into the chemistry curriculum*

Monday, June 12, 2017, 10 a.m. – 2 p.m.

*American Chemical Society, Washington, DC*

**Organizers:**

Amy Cannon, Ph.D., Beyond Benign
Karolina Mellor, Ph.D., Yale University
Pam Spencer, Ph.D., ANGUS Chemical Company

We live in the times of converging trends where chemists and toxicologists work together to understand the toxic effects of chemicals. And while significant progress has been made to explain how chemicals impact human health and the environment, there is still a lack of proper training among chemists to understand how toxicology can be incorporated into curriculum such that it prepares the next generation scientists for this transdisciplinary career. This hands-on workshop will gather toxicology experts to provide faculty and practitioners with background and cutting edge information on toxicology and related topics.

**ACS CAREERS WORKSHOP**

*ChemIDP™ Workshop: Planning For Your Career*

Wednesday, June 14, 2017, 7 – 9:30 p.m.

*Lake Audubon*

*Sign up on site at the GC&E registration desk.*

**Instructors:**

Corrie Kuniyoshi, Ph.D., American Chemical Society
Jodi Wesemann, Ph.D., American Chemical Society

Organized by ACS GCI in collaboration with the ACS Careers & Education Departments, conference attendees are invited to join expert career consultants from the American Chemical Society who will provide a host of pertinent information guaranteed to accelerate one’s professional development. Topics will include: strengthening your skills, setting goals, assessing oneself, exploring careers, finding your career “sweet spot,” completing an individual development plan (IDP) and more! This information session will also be an excellent way for job seekers to enhance their networking skills, free of charge!
FUN RUN/WALK
Thursday, June 15, 2017 at 6:30 a.m.
Meet at the Hotel Lobby

Lace up your running shoes and get ready to start your morning off with a light run (or walk) on the scenic, wooded Washington & Old Dominion Railroad Trail. We will meet in the hotel lobby for a group photo before we head out. Don’t miss this opportunity to stretch your legs and connect with fellow green chemistry enthusiasts!

GREEN CHEMISTRY ON TAP
Thursday, June 15, 2017 at 6 p.m.
Meet at the Hotel Lobby

Relax with friends and colleagues on a pub crawl through Reston Town Center. At each participating pub, there will be a different green chemistry issue being discussed by our topical experts. The Pub Crawl is a great way to meet new people and expand your network in a comfortable, low key environment. Topics will be announced on site.

GREEN EXPO
June 13-14, 8 a.m.-5 p.m.; June 15, 8 a.m. – 3 p.m.
Grand Ballroom Foyer

Don’t miss out on visiting our exhibitors! Learn about new technologies and programs and visit the ACS store. Networking coffee breaks will be offered morning and afternoon in the Expo area.
Information for Presenters

ORAL PRESENTERS
Please check-in at the Speaker Ready Room (Technology Office) as soon as possible, but at least one hour before your presentation. This will allow for a final quality check and ensure that the formatting, fonts, animations and other features of your presentation(s) will appear correctly during your session. The Speaker Ready Room computers are configured with the same hardware and software as those in the presentation rooms. You may bring your own computer, but we recommend that you use the computer equipment provided in each presentation room. You will upload your presentation in your session room. Please arrive during the break before your session begins.

Speaker Ready Room Hours of Operation
Tuesday, June 13 7 a.m. – 5 p.m.
Wednesday, June 14 7 a.m. – 5 p.m.
Thursday, June 15 7:30 a.m. – 3 p.m.

Technical session rooms are equipped with the following standard AV equipment:
- LCD projector with VGA
- Podium with microphone connection cable and switcher
- Lavaliere microphone
- PC computer
- Screen
- Laser pointer

POSTER PRESENTERS
The posters session is Wednesday, June 14. Even poster numbers will be presented from 4:35-5:35 p.m. Odd poster numbers will be presented from 5:35-6:35 p.m. Authors must remain with their poster for the duration of your session to discuss the results and answer questions from other attendees.

Poster must be hung between 12:30-3:10 p.m. on Wednesday. Posters must be removed after the last poster session (6:35 p.m.) and before 7 p.m. The ACS Green Chemistry Institute® will not assume responsibility for any materials left behind after 7 p.m. on June 14.

Poster numbers supplied by ACS GCI will be placed in the upper corner of each poster board. This number corresponds with the number assigned to each paper in the program book/mobile app.
Online Access

WI-FI ACCESS PROVIDED BY ACS GCI
Your Network: PSAV_Event_Solutions
Access Code: acsgreen2017
1. Connect to your Wi-Fi network
2. Open your web browser
3. Refresh your home page
4. Input your access code into the splash page

CONFERENCE PROGRAM BOOKS
We encourage everyone to access the program via the mobile app for the most up-to-date information. Help will be provided at the registration desk to download the app. The online program is also available at gcande.org/program. This will be the last year that ACS GCI prints a full program book. Conference program books are $25 each this year and there are limited copies available.

Manage Your Conference Schedule
Download the Free Mobile App
Search GCEC in your app store or enter the appropriate URL into your mobile web browser to download the app.

http://ativ.me/6im  http://ativ.me/6in  http://ativ.me/gcec2017
### SCHEDULE Tuesday, June 13, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>7:30 a.m.</td>
<td>Networking Breakfast — Grand Ballroom E-G</td>
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<tr>
<td>8:30 a.m.</td>
<td>Welcome Remarks — Grand Ballroom A-D</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>Keynote Address presented by William Feehery — Grand Ballroom A-D</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>Networking Coffee Break — Grand Ballroom Foyer</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>Introductory Remarks.</td>
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<tr>
<td>9:50 a.m.</td>
<td>Selective halogenation using engineered halogenases. — J.C. Lewis</td>
</tr>
<tr>
<td>10:50 a.m.</td>
<td>5. Green chemistry equals social &amp; environmental justice: Symposium overview. — E.J. Brush, G. Lasker</td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>12. Alternatives for sustainable chemical manufacturing. — R.G. Giraud</td>
</tr>
<tr>
<td>11:50 a.m.</td>
<td>13. Separations for sustainable manufacturing in the pulp &amp; paper industry. — D. Turpin</td>
</tr>
<tr>
<td>12:30 p.m.</td>
<td>Lunch on your own</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>14. Sustainable separations: Practice and theory. — G.J. Lipcombe, R.G. Giraud</td>
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<tr>
<td>2:20 p.m.</td>
<td>15. Pathway of toxicity approaches for hazard assessment. — A. Maertens, T.W. Bacha</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>17. Separation of olefins and paraffins using custom amorphous fluoropolymer facilitated transport membranes. — R. Stanzione, S. Curia, G. Palme, T. Price, T.W. Bacha, D.J. Heckmann, J.F. Stanzione</td>
</tr>
<tr>
<td>3:20 p.m.</td>
<td>18. Modular chemical process intensification for clean energy manufacturing. — J. Bolenberg</td>
</tr>
<tr>
<td>3:40 p.m.</td>
<td>19. Multipurpose objective trade-off method to assess commercial paint strippers. — S. Pacheco Shubin, T.A. Lewandowski</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>20. Preparing ingredient safety inventories for 588 ingredients. — N. Simcox, J.F. Stanzione</td>
</tr>
<tr>
<td>4:40 p.m.</td>
<td>22. Green chemistry: Invention with intention to avoid harm. — S.P. Cook</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>23. New strategies for hydrocarbon functionalization. — E.J. Alexanian</td>
</tr>
<tr>
<td>5:20 p.m.</td>
<td>24. Catalytic reactions at metal-membrane bonds. — C. Uyeda</td>
</tr>
<tr>
<td>5:40 p.m.</td>
<td>25. Reingeniering chemical properties of biobased and biobased derived polymers to enable safer use of chemicals in consumer products. — S.P. Cook</td>
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</table>

### TECHNICAL SESSIONS

**DEVELOPMENT OF NOVEL ENZYMES DEDICATED FOR SYNTHESIS**

**GREEN CHEMISTRY EQUALS SOCIAL & ENVIRONMENTAL JUSTICE: THEORY & PRACTICE**

**SEPARATIONS FOR SUSTAINABLE MANUFACTURING: THE ROAD AHEAD**

**SUSTAINABLE CHEMICALS: TECHNOLOGIES FOR MOLECULAR HYGIENE AND RISK ASSESSMENT**

**SUSTAINABLE DESIGN OF POLYMERS & POLYMER COMPOSITES FROM XYLOCHEMICALS**

**THE WILD ‘GREEN’ ON EMBRYO: ENVIRONMENTAL TOOLS TO ENABLE SUSTAINABLE ORGANIC SYNTHESIS**

<table>
<thead>
<tr>
<th>Location</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>Lake Anne</td>
<td>J.J. Lalonde, Organizer; G. Lasker, Organizers, President</td>
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<tr>
<td>Lake Audubon</td>
<td>R.G. Giraud, Organizer; D. Webster, President</td>
</tr>
<tr>
<td>Lake Fairfax</td>
<td>J.F. Stanzione, J.J. Scalla, Organizers, President</td>
</tr>
<tr>
<td>Town Center</td>
<td>B.A. Spratling, Organizer, President</td>
</tr>
<tr>
<td>Reston</td>
<td>S.A. Cannon, K. Miller, Organizers, President</td>
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### TECHNICAL SESSIONS

**ENVIRONMENTAL JUSTICE: THEORY & PRACTICE**

**PRACTICE**

**SEPARATIONS FOR SUSTAINABLE MANUFACTURING**

<table>
<thead>
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<tr>
<td>Lake Audubon</td>
<td>J. Spangler, Organizer, Providing</td>
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<tr>
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<tr>
<td>Grand Ballroom E-G</td>
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</tr>
<tr>
<td>Grand Ballroom F-G</td>
<td>R.G. Giraud, Organizer, D. Webster, President</td>
</tr>
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<td>S.A. Cannon, K. Miller, Organizers, President</td>
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</tbody>
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### TECHNICAL SESSIONS

**PRACTICE**

**SEPARATIONS FOR SUSTAINABLE MANUFACTURING**

**SEPARATIONS FOR SUSTAINABLE MANUFACTURING**

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<tr>
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<td>J. Liang</td>
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<tr>
<td>Lake Anne</td>
<td>E.J. Brush, G. Lasker, Organizers, President</td>
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<tr>
<td>Lake Audubon</td>
<td>J. Spangler, Organizer, Providing</td>
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<td>Grand Ballroom E-G</td>
<td>J. J. Lalonde, Organizer, G. Lasker, Organizers, President</td>
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<tr>
<td>Grand Ballroom F-G</td>
<td>R.G. Giraud, Organizer, D. Webster, President</td>
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<tr>
<td>Reston</td>
<td>S.A. Cannon, K. Miller, Organizers, President</td>
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### TECHNICAL SESSIONS

**PRACTICE**

**SEPARATIONS FOR SUSTAINABLE MANUFACTURING**

**SEPARATIONS FOR SUSTAINABLE MANUFACTURING**

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<td>S.A. Cannon, K. Miller, Organizers, President</td>
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SCHEDULE / Tuesday, June 13, 2017

### TECHNICAL SESSIONS

#### ROLE OF RECYCLING, BUILDING A SUSTAINABLE TOMORROW

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>1:30 p.m.</td>
<td>Introductory Remarks.</td>
<td>Regency Ballroom A</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>Challenges of sustainable materials development and waste management, M. Sabahi</td>
<td>Regency Ballroom A</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>The medicines-for-all initiative. P. Gupton</td>
<td>Lake Fairfax</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>Recovery of plant nutrients from waste streams: Transforming industrial waste into enhanced efficiency fertilizers. J. Bertuvis</td>
<td>Town Center</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>Integration.</td>
<td>Intermision</td>
</tr>
<tr>
<td>5:15 p.m.</td>
<td>Development and application of electrocatalytic oxidation reactions involving oxyl radical mediators. M. Rafiee, S.S. Shahi</td>
<td>Intermision</td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td>Safety evaluation of complex mixtures: Novel application of read-across, TTC, and use of chemical groups. T. Adams, S. Socie</td>
<td>Intermision</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Future of sustainable chemistry in the supply chain. M. Paglie, A. Moretta, L. Chan</td>
<td>Intermision</td>
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#### SUSTAINABLE PROCESS DESIGN: THE KEY TO MINIMIZE ENVIRONMENTAL IMPACT, MAXIMIZE COST EFFICIENCY, AND DRIVE INNOVATION

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<tbody>
<tr>
<td>7:30 p.m.</td>
<td>Antagonist effect of hydrogen bonds on the cyclic carbonate/amine reaction: A technology of choice to substitute isocyanate of polyurethanes materials. A. Correll, M. Blain, R. Auvéregne, B. Boutin, S. Caillol</td>
<td>Intermision</td>
</tr>
<tr>
<td>8:15 p.m.</td>
<td>Alternative solvents: From a compliance-driven activity to a trigger for innovation. Y. Liu</td>
<td>Intermision</td>
</tr>
<tr>
<td>9:00 p.m.</td>
<td>Product safety assessment screening tools: A method to integrate principles of toxicology into chemistry curriculum. P. Spencer, D. Green</td>
<td>Intermision</td>
</tr>
<tr>
<td>9:45 p.m.</td>
<td>Teaching toxicology concepts to chemists: Web-based student tutorial system for chemical hazard, risk and lifecycle assessment. G.R. Thompson</td>
<td>Intermision</td>
</tr>
<tr>
<td>10:30 p.m.</td>
<td>Using computer games to introduce green chemistry and safer chemical design concepts into an undergraduate curriculum. K. Meller, P. Cech, N. Simon, G. Lasker, M. Mullins, S. Neinstein, P. Anisias</td>
<td>Intermision</td>
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</table>

#### TOXICOLOGY INTO CHEMISTRY: UNIQUE COURSES & PROGRAMS - SESSION II

<table>
<thead>
<tr>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>10:30 p.m.</td>
<td>Designing a sustainable toxicology undergraduate curriculum. D.G. Kever, K. Reddick</td>
<td>Intermision</td>
</tr>
<tr>
<td>11:15 p.m.</td>
<td>Antimicrobial properties of eco-friendly food packaging. A.S. Ryan, M. Bertrand, M. Modugno, D.C. Webster</td>
<td>Intermision</td>
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</tbody>
</table>

### ADVANCES IN CONTINUOUS CHEMISTRY

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<tbody>
<tr>
<td>1:00 p.m.</td>
<td>Catalyzed non-isocyanate polyurethanes from carbonated soybean oil using diamines: From thermosets to thermoplastics. J. Roque, I. Pissard, B. Gignard, C. Jerome, C. Deteuilbou, P. Dubois</td>
<td>Lake Fairfax</td>
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#### SUSTAINABLE CHEMICALS TECHNOLOGIES FOR MODELING HAZARDOUS RISK ASSESSMENT - SESSION II

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<tbody>
<tr>
<td>2:30 p.m.</td>
<td>S. Caillol, M. Kared, Organizers, Presiding</td>
<td>Lake Fairfax</td>
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<tr>
<td>3:15 p.m.</td>
<td>A. Coffin, M. Kared, Organizers, Presiding</td>
<td>Lake Fairfax</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>S. Caillol, M. Kared, Organizers, Presiding</td>
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#### DESIGN & ROUTES FOR SUSTAINABLE POLYURETHANES

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<tr>
<td>3:15 p.m.</td>
<td>Catalyzed non-isocyanate polyurethanes (NiPPI) coatings from bio-based cyclic carbonates. A.Z. Pa, D.C. Webster</td>
<td>Lake Fairfax</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>An integrated toxicology education program for the design and development of biocatalysts for the production of an environmentally friendly biocatalyst. A.S. Ryan, M. Bertrand, M. Modugno, D.C. Webster</td>
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#### MODELING HAZARD/RISK ASSESSMENT - SESSION II

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<td>3:15 p.m.</td>
<td>Catalysts of a revolutionary concept: Linking green chemistry and drug discovery. S. Caillol, M. Kared, Organizers, Presiding</td>
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#### TOXICOLOGY FOR CHEMISTS: UNIQUE COURSES & PROGRAMS - SESSION II

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#### GREENX: Rising Stars — Grand Ballroom A-D

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<tr>
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<tbody>
<tr>
<td>4:45 p.m.</td>
<td>GREENX: Rising Stars — Grand Ballroom A-D</td>
<td>Grand Ballroom A-D</td>
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<tr>
<td>5:30 p.m.</td>
<td>Welcome Reception — Regency Ballroom</td>
<td>Regency Ballroom A</td>
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<td>Time</td>
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<tr>
<td>9:45 a.m.</td>
<td>Introductory Remarks.</td>
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<tr>
<td>10:00 a.m.</td>
<td>123.  Elucidating electronic support interactions: Rational approaches to the design of supported catalysts. A. Voutchkova</td>
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<tr>
<td>10:50 a.m.</td>
<td>124.  A pragmatic approach to the intersection of inventive chemistry and materials science. J. Baltrusaitis</td>
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<tr>
<td>11:00 a.m.</td>
<td>125.  The intersection of green chemistry and Steelcase’s path to circular economy. J. Smajka</td>
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<tr>
<td>11:10 a.m.</td>
<td>126.  How Dow’s 2025 sustainability goals are helping advance the circular economy. S. Hunter, R. Helling, W. Jeff</td>
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<tr>
<td>11:50 a.m.</td>
<td>128.  Delta: An environmentally benign and worker safe asphalt additive. J. Bianchini</td>
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<tr>
<td>12:10 p.m.</td>
<td>129.  Bimetallic catalysts: Oxidative desulfurization of crude glycerol to valuable commodity chemicals. C. Lam, A. Bloomfield, P. Atanas</td>
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<tr>
<td>12:30 p.m.</td>
<td>Lunch on your own</td>
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**SCHEDULE / Wednesday, June 14, 2017**

**7:30 a.m.** Networking Breakfast — Grand Ballroom E-G

**8:30 a.m.** Welcome Remarks — Grand Ballroom A-D

**8:45 a.m.** Keynote Address presented by Jillian Buriak, Ph.D. — Grand Ballroom A-D

**9:30 a.m.** Networking Coffee Break — Grand Ballroom Foyer

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**NEW CHEMISTRY THROUGH CATALYSIS**

**12:30 p.m.** Lunch on your own

**10:10 a.m.** 8:45 a.m. Welcome Remarks — Grand Ballroom A

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**SESSIONS**

**NEW CHEMISTRY THROUGH CATALYSIS**

**10:50 a.m.** 8:30 a.m. Networking Breakfast — Grand Ballroom A-D

**11:30 a.m.** 8:45 a.m. Keynote Address presented by Jillian Buriak, Ph.D. — Grand Ballroom A-D

**12:10 p.m.** 9:30 a.m. Networking Coffee Break — Grand Ballroom Foyer

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**SESSIONS**

**8:30 a.m.** 7:30 a.m. Welcome Remarks — Grand Ballroom A-D

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**SESSIONS**

**8:45 a.m.** 7:00 a.m. – 5:00 p.m. Registration Level 2

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**SESSIONS**

**8:45 a.m.** 8:00 a.m. – 5:00 p.m. Grand Ballroom Foyer

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**SESSIONS**

**8:45 a.m.** 7:00 a.m. – 5:00 p.m. Grand Ballroom Foyer

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**SESSIONS**

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**SESSIONS**

**8:45 a.m.** 7:00 a.m. – 5:00 p.m. Grand Ballroom Foyer

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**SESSIONS**

**8:45 a.m.** 8:00 a.m. – 5:00 p.m. Grand Ballroom Foyer
SCHEDULE / Wednesday, June 14, 2017

TECHNICAL SESSIONS

Lake Anne
Regency Ballroom A
J. Piper, Organizer, Presiding

Lake Audubon
Regency Ballroom B
J. C. Weiner, Organizer, Presiding

Lake Fairfax
Town Center
C. K. Che, C. Melh, Organizers

2:15 p.m.
2:55 p.m.
3:15 p.m.
1:30 p.m.
1:55 p.m.

3:15 p.m.
3:35 p.m.
3:55 p.m.

135
133
132


133
132
131
130

130. The discovery and design of new ligands for nickel-catalyzed reductive coupling. D. Pedro
131. Toward sustainable H-N insertion by iron porphyrin catalysts: Catalytic mechanism and origin of substrate selectivity. R. Khade, Y. Zhang

Designing sustainable high-value skincare products and processes. J. Piper, Organizer, Presiding

132. Addressing less reactive electrophiles in cross-electrophile coupling reactions. D. J. Weix

Designing sustainable high-value skincare products and processes. J. Piper, Organizer, Presiding


2:15 p.m.

2:55 p.m.

160. Conceptual design and implementation of the circular economy in formulated consumer products. M. P. Wolf, C. Bergeon

2:35 p.m.

4:15 p.m.


Safer Made ventures: Supporting greener chemistry. M. Jalbert

Finding government funding for green chemistry. M. Jalbert

148. Safer Made ventures: Supporting greener chemistry. M. Jalbert

147. Safer Made ventures: Supporting greener chemistry. M. Jalbert

146. Withdrawal - Membrane-based water recovery in coffee manufacture.

168. An approach to non-chromatographic purification of macro-cyclic peptides. G. Greech


147. Safer Made ventures: Supporting greener chemistry. M. Jalbert

144. Carbon dioxide as a feedstock for performance materials. S. Allen

165. Advancing greener peptide and oligonucleotide synthesis. M. E. Hippach

143. Defining sustainable synthesis. S. Allen


139. Hydrogenation of levulinic acid: From fundamental science to demo plant application. J. Engendahl, C. Jung, W. Letner, J. Klarakaymer

138. New York State Pollution Prevention Institute: A partnership between state government and academia. C. J. Huffing

137. Using the Rowan University engineering clinics to advance sustainable processing and manufacturing. C. Slater, M. J. Savelski

136. Chemical reaction in aqueous solution for the synthesis of pesticides and proteins. S. Kent

135. Developing processes in more sustainable ingredients and their implementation in formulations. C. Chey

134. Cu-catalyzed 1,3-C-H amidation: Catalyst controlled site-selectivity. A. Bahshoda, T. H. Quinn


132. Addressing less reactive electrophiles in cross-electrophile coupling reactions. D. J. Weix

131. Toward sustainable H-N insertion by iron porphyrin catalysts: Catalytic mechanism and origin of substrate selectivity. R. Khade, Y. Zhang

130. The discovery and design of new ligands for nickel-catalyzed reductive coupling. D. Pedro

149. Carbon dioxide switchable polymers and processes. M. J. Savelski, T. M. Schuhmeyer

148. Safer Made ventures: Supporting greener chemistry. M. Jalbert

147. Safer Made ventures: Supporting greener chemistry. M. Jalbert
<table>
<thead>
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<tr>
<td>9:00 a.m.</td>
<td>Introductory Remarks.</td>
</tr>
<tr>
<td>11:10 a.m.</td>
<td>Molecular principles of green nanomaterials recognition and assembly from molecular nanostructures and their ligand-mediated sorting. C. Walton, J. Murray, H. Grant.</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Light-harvesting Engineered photosynthesis. Paul Chirik, Ph.D.</td>
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</table>
21st Annual Green Chemistry & Engineering Conference

SCHEDULE / Thursday, June 15, 2017

12:30 p.m. Lunch on your own

TECHNICAL SESSIONS

1:55 p.m. Introductory Remarks.

2:00 p.m. Evaluating three oxidation procedures in the organic laboratory. A. E. Khunag

2:15 p.m. Intermission

2:20 p.m. Incorporating green chemistry into advanced organic and undergraduate research. S. A. Hennet

2:35 p.m. Synthesis of azobenzene using a solvent-free aldol reaction and a three-step one-pot transformation. J. Wieland, K. Carin

2:40 p.m. Advances in nickel-catalyzed amidic C-N bond activation. J. E. Dander, N. K. Garg

2:45 p.m. A concise, efficient and scalable total synthesis of thapsigargin. D. Chen, H. Qiao, J. Hoyt, J. E. Steves, P. J. Chirik

2:50 p.m. Base metal catalyzed oxidative annihilation of unactivated allyl chlorides. F. A. Ack, S. P. Cook

3:05 p.m. Mechanistic analysis of lignin dehydrogenation of glycerol to lactic acid by single-site heterogeneous catalysts. S. A. Henrie

3:10 p.m. Dehydrogenation of glycerol to lactic acid in water enabled by catalytic ionic liquids. W. E. Hart

3:15 p.m. Reverse biomass hydrolysis fractionation in an ionic liquid through conventional fractionation. W. A. Souza, T. E. Semelesberger, O. W. Staples

3:20 p.m. A necessary step as you know? A. Voutchkova

3:25 p.m. Hydration of stearic acid over palladium supported catalysts. K. M. Souza, C. Ashman

3:30 p.m. Hydrothermal decarboxylation of sebacic acid over palladium supported catalysts. M. R. Souza, R. C. Buck

3:35 p.m. Hydroxylamine hydroxylation of sebacic acid over palladium supported catalysts. M. R. Souza, R. S. MacKellar

3:40 p.m. Intermission

3:45 p.m. Dehydrogenation of glycerol to lactic acid in water enabled by catalytic ionic liquids. W. A. Souza, T. E. Semelesberger, O. W. Staples

3:50 p.m. A necessary step as you know? A. Voutchkova

3:55 p.m. Hydrothermal decarboxylation of sebacic acid over palladium supported catalysts. M. R. Souza, R. C. Buck

4:00 p.m. Hydroxylamine hydroxylation of sebacic acid over palladium supported catalysts. M. R. Souza, R. S. MacKellar

4:05 p.m. Intermission

4:10 p.m. Panel Discussion.

4:15 p.m. A concise, efficient and scalable total synthesis of thapsigargin. D. Chen, F. A. Evans, T. E. Semelesberger, O. W. Staples

4:20 p.m. Dehydrogenation of glycerol to lactic acid in water enabled by catalytic ionic liquids. W. A. Souza, T. E. Semelesberger, O. W. Staples

4:25 p.m. A necessary step as you know? A. Voutchkova

4:30 p.m. Hydrothermal decarboxylation of sebacic acid over palladium supported catalysts. M. R. Souza, R. C. Buck

4:35 p.m. Hydroxylamine hydroxylation of sebacic acid over palladium supported catalysts. M. R. Souza, R. S. MacKellar

4:40 p.m. Intermission

4:45 p.m. Concluding Remarks.

5:00 p.m. Use of biodegradable molecular building blocks for the simultaneous production of fuels and chemicals. A. P. Evans, T. E. Semelesberger, O. W. Staples

5:05 p.m. Measuring silica dust control in the field. G. Rojas, J. M. Subramaniam, P. D. Allen

5:10 p.m. Maximizing silica dust control in the field. G. Rojas, J. M. Subramaniam, P. D. Allen

5:15 p.m. Intermission

5:20 p.m. Hallucination. J. M. Subramaniam, P. D. Allen

5:25 p.m. Concluding Remarks.
**Poster Session**

**Wednesday, 4:35 – 5:35 p.m.** (even numbers)  
**Wednesday, 5:35 – 6:35 p.m.** (odd numbers)

**Grand Ballroom E-G**

**Organizers:** D. K. Leahy, A. Sehgal

**Student Poster Chair:** R. Blackburn

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172. **Design of sustainable reactions through earth abundant element photocatalysis.** **J.G. West**, E.J. Sorensen, T. Bedell, D. Huang, D. Abrams

173. **Grass roots green chemistry in industry.** **C. McManus**


176. **Operational practices and flow diagrams for assessing alternatives.** **D. Versteeg**, A.M. Mason, R. Helling, B. Landenberger, S. Risotto

178. **“Green Chemistry Adoption” among different industries, and its demands.** **N. Vaidya**

179. **Anthocyanins as an ingredient for food industry: Strategy for extraction and enhanced stability.** **M. Kumar**, A. Dahuja, A. Sachdev, C. Kaur, E. Varghese, S. Saha, K. Sairam

180. **Heterogeneous catalytic dephosphorylation for efficient and renewable phosphorus production.** **M. Manto**, P. Xie, C. Wang

181. **Carboxymethyl cellulose modified cellulose devices for immunoassay applications.** **C. Yang**, H. Lin, **C. Chen**

182. **Non-toxic amphiphilic fouling-release coatings via self-stratification.** **D.C. Webster**, T.P. Galhenage, S. Stafslien, L. Vanderwaal
183. **Photocatalytic oxidation processes on anatase titanium dioxide.** S.F. Li, X. Lin

185. **Nitrogen-doped graphene catalysts by high energy wet ball milling: Effect of synthesis processing time and speed to particle size, and the characteristics of physical and chemical properties.** S. Zhuang, B. Nunna, E. Lee

187. **Cashew nut shell liquid: A potential corrosion inhibitor for the oil and gas industry.** L.B. Furtado, R.C. Nascimento, M.O. Guimarães, P.R. Seidl

188. **Earth abundant aluminum nanoparticles for green photocatalysis.** Y. Cheng, K. Smith, E. Arinze, A.E. Bragg, S.M. Thon

193. **A green headspace GC method for residual solvents using no helium with improved resolution and speed.** J. Kay, C. Venkatramani, L. Wigman

195. **Screening of amine based deep eutectic solvents for post combustion carbon capture.** I. Adeyemi, M. Abu Zahra, E. Al Nashef

196. **Levulinic acid esters as replacement of dichloromethane (DCM) and N-methyl pyrolidone (NMP).** B. Engendahl, T. Fennelly

197. **Investigating deep eutectic solvents for biomass fractionation.** J.R. Meyer, M.B. Foston

199. **Process optimization for the synthesis of gold and copper nanoparticles from a mixed precursor solution.** K. Dill, M. Moustafa, C. Tang, N.A. Lewinski

201. **Ionic liquid pretreatment of lignocellulosic biomass: Effect of biomass composition on pretreatment efficiency.** V. Kotia, V. Ranganathan, V. Rangaswamy, P. Aduri, S. Noronha, D. MacFarlane, A. Patti

203. **Simultaneous isomerization and reactive extraction followed by back extraction of sugars from biomass hydrolysate for high purity and yield of xylulose.** P. Zhang, S. Varanasi, P. Relue
206. **Synthesis of Dilantin using green chemistry.** V. Sublett, D.J. Swartling

207. **Platinum-nano-dispersed in sol-gel-derived organically modified silicates as catalysts for the hydrosilylation reactions.** E. Akeroyd, S. Bhatt, S. Bhatt, B. Duke, J. Fotie

208. **Mechanochemistry and hard soft acid base theory: A match made in heaven.** L.N. Trankina

209. **Application of LCA and green chemistry principles to guide fine chemical manufacturing: A case study of fullerene extraction and purification.** E. Lee, C. Andrews, A. Anctil

210. **Lignin valorization for the integrated bio-refinery.** L. Petitjean, E.S. Beach, P.T. Anastas

212. **New iron P-NH-P’ asymmetric pressure hydrogenation catalysts.** S.A. Smith, P.O. Lagaditis, A. Luepke, A.J. Lough, R.H. Morris

213. **Hydrogen peroxide synthesis using defects sites in graphene hydroxide.** B.T. Nguyen, M. Groves

214. **Specialty chemical production from natural oils via olefin metathesis.** T.E. Snead, S.A. Cohen, R.T. Behrends

216. **Catalytic dehydrogenative coupling of amines.** D. Ainembabazi, N. Tiedemann, A. Voutchkova

217. **Greening the inorganic chemistry laboratory course.** T.K. Brescia, D. Athanasopoulos, R.K. Upmacis

218. **Effect of water on resinification of artificial spider silk powder and its property.** S. Hirai, Y. Ubukata, H.A. Tuan

219. **A non-novel metal nanocatalyst for tandem reaction of ammonia borane dehydrogenation and nitro/nitrile hydrogenation.** C. Yu, M. Muzzio, S. Sun

220. **Synthesis of new flavanoid and chalcone derivatives as antimicrobial agent by green chemistry approach.** D.D. Patel
221. Silica encapsulated magnetic nanocomposites for diverse catalytic applications. S. Dutta, R.K. Sharma

222. Novel low temperature, low energy and high efficiency wood pretreatment technology with a redox couple catalyst. P. Gogoi, Z. Zhang, Y. Deng

223. Roles for CO$_2$ in obtaining chemical products from biomass. P.G. Jessop, P. Champagne

224. Synthesis of bio-oil via the hydrothermal liquefaction of chlorella in the presence of a KOH or Ca(NO$_3$)$_2$ catalyst. N.T. Humphries

225. Highly efficient DSSC from new azobenzene-bridged metal-free organic dyes. K. Chiu, T. Tran, S. Chang, T. Yang, Y. Su


228. Development of new supported base metals catalysts for green and sustainable chemical synthesis. A. Sharma, R.K. Sharma

229. Designing and synthesis of a chelating polymer for the recovery of metals from differently charged wastewater. R.K. Sharma

230. Thermochemical approach for valorization of waste streams from food, dairy, and wastewater treatment industries using subcritical water. B. Cantero-Tubilla, R. Posmanik, J. Tester


235. Design, synthesis of magnetic nano-catalysts and their applications in cross-coupling and oxidation reactions. M. Yadav

236. A new metric for scoring hazard and risk. H. Plugge

237. Automated integration of hazard, exposure, and risk assessments for chemicals and products. G.R. Thompson

238. Quantitative green chemical and product ecological, health, and safety metrics for hazard and risk assessments. G.R. Thompson

239. Empowering undergraduates to be green chemistry ambassadors in their community through outreach. M.C. Enright, A. Giarross, J. Romeo, D. Dang, J. Davis, C. Olbrich

240. Facile, green approach for chemical treatment of flax fibers. B. Fathi, S. Elkoun, M. Robert


243. Copper catalyzed functionalization of un-activated sp$^3$ C-H bonds via carbon-carbon bond formation. O.E. Okoromoba, T.H. Warren


245. Polymeric replacements for traditional alkane solvents. T. Malinski, D.E. Bergbreiter

246. A green method to form tricyclic and tetracyclic heterocycles, such as protonated azomethine imine salts. R. Dhakal, M. Brewer

248. Developing a laboratory protocol for green enzymatic halogenation to encourage a sustainable approach to and holistic understanding of halogenation in organic chemistry laboratories. A. Meraban, M. Lyon, M. Rudibaugh
249. Predicting physical properties: A key tool for designing sustainable processes. **K.G. Joback**


251. Doing more with less: Opportunities for green chemistry and engineering in action research and development. **C.D. Jensen**

345. Encapsulation of natural antioxidants of potato (Ipomea Batata) in biodegradable nanoparticles of polylactic acid. **N. lis Garcia**

Design an effective and green adsorption system for antibiotic removal from water: Combined experimental and computational studies. **H. Behnejad**

Understanding the interaction between nanomaterials and bacteria to inform design of next-generation antimicrobials. **L.M. Stabryla**
Congratulations to the Student Award Winners

KENNETH G. HANCOCK MEMORIAL AWARD
This annual award recognizes outstanding student contributions to furthering the goals of green chemistry through research or education. The Hancock Award is sponsored by the ACS Division of Environmental Chemistry and by the National Institute of Standards and Technology. It is administered by ACS Green Chemistry Institute®. The 2017 awardees attending this conference are:

Graduate Student Awardee:
Julian West, Princeton University

Undergraduate Student Awardee:
Adam Fisher, United States Merchant Marine Academy

JOSEPH BREEN MEMORIAL FELLOWSHIP
This annual award sponsors a young international green chemistry scholar to participate in a green chemistry technical meeting, conference, or training program. The Breen Fellowship is sponsored by the ACS International Endowment Fund and administered by ACS Green Chemistry Institute®. The 2017 awardees attending this conference are:

Graduate Student Awardee:
Samantha Smith, University of Toronto

Undergraduate Student Awardee:
Caitilin McManus, Trinity College, Dublin
CIBA TRAVEL AWARD IN GREEN CHEMISTRY

This annual award sponsors participation of students (high school, undergraduate and graduate) in an ACS technical meeting, conference, or training program that has a significant green chemistry or sustainability component. The award is sponsored by the Ciba Green Chemistry Student Endowment and administered by ACS Green Chemistry Institute®. The 2016 awardees are either attending this conference or attended the 253rd ACS National Meeting in San Francisco.

Badri Bhattarai, University of Toledo
Rebecca Haley, University of Connecticut
Lauren Pincus, Yale University
Lisa Stabryla, Pittsburgh University
## GC&E Loyal Conference Attendees

The loyalty program honors and recognizes repeat Conference attendees throughout the years and appreciates their dedication to Green Chemistry and Engineering and the American Chemical Society. To qualify to be recognized as a GC&E Loyal Attendee, registrants must have attended at least four of our past 14 GC&E Conferences. As of May 15, the 2017 GC&E Loyal Attendees are:

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*Conference attendees who’ve come to at least four of our last 14 GC&E conferences as of May 15, 2017.*
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