AIChE SUSTAINABLE ENGINEERING FORUM NEWSLETTER



Message from the Chair

As the new SEF Chair, I'd like to begin by thanking my predecessor, David Thompson. The SEF made numerous strides forward under his leadership and I hope that as Chair, I can continue the momentum from David's term. This is an exciting time for the SEF. One of the many achievements from David Thompson's term as chair was the formation of the SEF Long Term Planning Committee.

The committee, chaired by Peter Knox, crafted a new Vision, Mission and Strategies for the SEF to better reflect where we are as a forum and were we want to go. Our new vision and mission, as stated by the committee is:

Vision - For the SEF to be widely perceived as a leading voice for sustainability and a central home for practitioners to communicate issues of sustainability with their colleagues around the world.

Mission – For the SEF to promote and accelerate the progression down the path to sustainability and disseminate cutting edge research and educational tools through its network of practicing professionals and educators in the field.

This is the vision and mission that will guide my 2-year term as SEF Chair. As part of our new vision, we are currently revamping our website, http://www.aiche.org/community/sites/divisions-forums/sustainable-engineering-forum-sef, to better serve our members. Stay tuned as new content is added over the coming months. We are also kicking off new initiatives such as quality improvement and metrics

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SEF Website:

http://www.aiche.org/sef

implementation, educational outreach, web development, module membership development and meeting the grand challenges in sustainability. Volunteers are welcome and needed to take on these initiatives. In a volunteer based organization like SEF, volunteers provide all the energy for continued momentum for the forum. If you are interested in getting involved, please e-mail me, or any of the other members of the leadership committee. as listed in the newsletter. On behalf of the leadership committee we look forward to welcoming many new volunteers to our organization.

Jeffrey R. Seay Chair, Sustainable Engineering Forum

Announcements

By Ray Smith

Webmaster Search

The SEF is looking for a webmaster to keep the site updated. The main benefits of volunteering for the position are networking and advancing the goals of SEF. A small stipend may be negotiated. The current website is available at https://www.aiche.org/community/sites/division s-forums/sustainable-engineering-forum-sef

SEF Awards

Applications for each of the SEF Awards are due April 30th. If you are nominating someone or plan to self apply, then questions can be sent marrerot@missouri.edu. to Tom Marrero These awards are briefly outlined in the Awards column. Also, see the AIChE/SEF web site, https://www.aiche.org/community/sites/division s-forums/sustainable-engineering-forumsef/awards

Tom Marrero SEF Awards Chairman

U.S. NSF - China NSF Workshop on Sustainable Manufacturing Held in China

Initiated by the U.S. NSF and China NSF, the U.S. NSF - China NSF Workshop on Sustainable Manufacturing was successfully held in Wuhan, China, March 13-15, 2014. Drs. Bruce Hamilton, JoAnn Lighty, and William Chang of the U.S. NSF as well as a number of China NSF officers attended the workshop. The workshop was co-chaired by Prof. Yinlun Huang of Wayne State University and Prof. Xinyu Shao of Huazhong University of Science and Technology of China.

The workshop was targeted to identify highpriority specific research objectives that could be pursued significantly better by collaborative U.S. - China research teams than by U.S.

researchers and China researchers working separately without U.S. - China collaboration. In the workshop, U.S. and China researchers defined high-priority sustainable manufacturing research objectives and discussed related collaborative research project areas that were potentially fundable jointly by the U.S. NSF and China NSF. The workshop was designed for broad and in-depth discussions of challenges, opportunities, and collaborations in critical areas mechanical/chemical sustainable of manufacturing. Participants from each country are leading/active scholars in mechanical, industrial. chemical, material, civil and environmental engineering. Thematic areas included (i) sustainable products and processes and (ii) sustainable manufacturing systems. These thematic areas covered most frontier research topics, such as product design efficiency innovations for resource and manufacturing process effectiveness, equipment design with minimum ecological footprints, smart manufacturing, fast and in-time green production, and sustainable supply chain and industrial ecology. The workshop greatly helped U.S. delegates gain a clear understanding of research on sustainable manufacturing in China, and identify high-level collaboration opportunities with Chinese colleagues. As the workshop was designed for multidisciplinary discussions, it was targeted to lead of cutting-edge identification areas in sustainable manufacturing and a plan for effective interdisciplinary collaboration.

The U.S. delegation was formed of 14 academic scholars of all ranks, including scholars from underrepresented groups. In specific, the workshop was co-funded by the Global Venture Fund (GVF) of NSF's International Science and Engineering section (ISE), as well as the CMMI and CBET divisions of NSF's Engineering Directorate.

Yinlun Huang SEF Technical Advisor

SEF 2014 Awards

By Tom Marrero

Sustainable Engineering Forum Student Paper Awards

Awards are presented to full-time undergraduate or graduate students who prepare the best technical papers that describe results related to engineering and sustainability.

Sustainability Education Award

The Sustainability Education award will recognize and honor one educator who has made outstanding contributions to sustainability education. Examples of contribution include, but are not limited to, successful incorporation of sustainability in the classroom or engineering community.

Research Excellence in Sustainable **Engineering Award**

Award is annually presented for basic or applied research results relative to the sustainability of products, processes, or the environment. The award is to recognize one who has made significant technical contributions to teaching and development activities.

in **Industrial Practice** Sustainable **Engineering Award**

This award recognizes individuals or teams who have made outstanding contributions over a long-term basis pertinent to sustainable engineering development in the practice of chemical process/product design or manufacturing.

Applications are due April 30, 2014.

Please send pertinent documents to: Thomas R. Marrero Professor University of Missouri -Columbia Chemical Engineering Department W2015 Lafferre Hall Columbia, MO 65211

Applicants or nominees who have questions may contact Dr. Marrero by e-mail (marrerot@missouri.edu) or phone (573-882-3802). If you send an e-mail, please include "SEF AWARD APPLICATION - 2014" in the subject line.

Announcements of award recipients will be on Thursday, June 5, 2014.

Sustainable Biorefineries Poster Session Award Recipients, AIChE 2013 annual conference

By Susan M. Stagg-Williams

San Francisco, CA was home to the 2013 AIChE Annual Conference and had record numbers of academic and industrial scholars presenting their work in numerous oral and poster sessions. The Sustainable Biorefineries Poster Session had 58 registered posters, of which 20 were eligible for the student poster competition. Six judges volunteered their time to select the top posters. This year's winners were as follows: In first place was Sumesh Sukumara from the Department of Chemical and Materials Engineering, University of Kentucky, Lexington, KY. Sumesh is a PhD candidate working with Dr. Jeffrey Seay. The title of his poster was "Process Optimization Models Supporting Multidisciplinary Framework Sustainable Biorefining". The second place winner was Niloofar Abdehagh from the Chemical Biological Engineering Department, and University of Ottawa, Ottawa, ON, Canada. Niloofar is a PhD candidate working with Dr. F. Handan Tezel and Dr. Jules Thibault. Niloofar's poster was titled "Bio-Butanol Separation By Adsorption: Adsorbent Screening Breakthrough Experiments". The third place winner was Ravi Challa. Ravi Challa, is a PhD candidate working with Dr. Kent Rausch from the Agricultural and Biological Engineering Department at the University of Illinois at Urbana Champaign. His poster was titled "Fouling Rates of Model Carbohydrate Solutions and Their Interaction Effects".

Programming Activities

By Sipho Ndlela

The programming activities for the AIChE 2014 annual meeting in San Francisco ended well under the guidance of Nathan Mosier. We also appreciate an extensive support system from various Chairs and Co-Chairs who dedicate their time and help make these programs a success. As I prepare to oversee the programming activities, I am excited to have received great training from Nathan especially in handling the CONFEX system ensuring that all sessions are properly listed and also communicating directly with sessions chairs and AIChE officials when necessary. I am optimistic that the 2014 Annual conference in Atlanta will be another success.

Currently under the SEF, we have 31 diverse sessions, and numerous co-sponsored sessions that are chaired by excellent professionals from academia and industry. I would like to thank everyone for their continued support of the SEF programs. To those Chairs and Co-Chairs who recently joined, we welcome you.

Please note that abstract submission for the 2014 annual meeting is open. I encourage all of you to spread the word to fellow scientists and engineers to submit their innovative ideas for presentation. Your role in promoting the upcoming conference continues to strengthen AIChE missions. I look forward to working with you in fulfilling the programming for SEF. See you all in Atlanta, GA.

Proposed SEF Sessions for the 2014 AIChE Annual Meeting in Atlanta, GA

23000 Division Plenary: Sustainability Plenary		
Chair	Jeffrey R. Seay, University of Kentucky College of Engineering, Kentucky 42002	
Co-Chair	Raymond Smith, US EPA	
23A00 Nanomaterials and Nanotechnology Sustainability		
Chair	Yinlun Huang, Wayne State University	
Co-Chair	Barbara Karn, Engineering-CBET, NSF, 4201 Wilson Blvd., Arlington, VA 22230	
23A01 Area Plenary: Optimizing Health, Safety & Environmental (HSE) Sustainably		
Chair	Eric Peterson, Technical Process Safety and Risk Management, MMI Engineering, 11490 Westhiemer Rd., Suite 150, Houston, TX 77077	
Co-Chair	Tracy J. Benson, Dan F. Smith Department of Chemical Engineering, Lamar University, PO 10053, Beaumont, TX 77710	
23A02 Process Design: Innovation for Sustainability		
Chair	Aydin K Sunol, Chemical & Biomedical Engineering, University of South Florida, 4202 E. Fowler Ave, ENB 118, Tampa, FL 33620	
Co-Chair	Cristina Piluso, BASF Corporation, 1609 Biddle Ave., Wyandotte, MI 48192	
23A03 Sustainability in Facility Siting		
Chair	Helen Lou, Dan F. Smith Department of Chemical Engineering, Lamar University, Dan F. Smith Dept. of Chemical Engineering, Beaumont, TX 77710	
Co-Chair	Morgan Reed, Technical Process Safety and Risk Management, MMI Engineering, 11490 Westheimer Road, Suite 150, Houston, TX 77077	

23A04 Environmental Health & Safety and Sustainability			
Chair	William M. Barrett, US Environmental Protection Agency, 26 W Martin Luther King Dr, MS-445, Cincinnati, OH 45268		
Co-Chair	Cory D. Jensen, Chemical Engineering, Colorado State University, 3539 Race St., Denver, CO 80205		
23B00 Reco	23B00 Recovery of Value-Added Co-Products from Biorefinery Residuals and Effluents		
Chair	Andro Mondala, Dave C. Swalm School of Chemical Engineering, Mississippi State University, P.O. Box 9595 MS 39762		
Co-Chair	Tracy Benson, Chemical Engineering, Lamar University, PO 10053, Beaumont, TX 77710		
23B01 Integrated Thermo-Chemical and Biochemical Processing for Renewable Fuels and			
Chemicals			
Chair	Tracy J. Benson, Dan F. Smith Department of Chemical Engineering, Lamar University, PO 10053, Beaumont, TX 77710		
Co-Chair	Christopher M. Saffron, Biosystems & Agricultural Engineering, Department of Forestry, Michigan State University, East Lansing, MI 48824		
23B02 Integrating Industrial Waste into Biorefineries			
Chair	Rafael Hernandez, Department of Chemical Engineering, University of Louisiana at Lafayette, Lafayette, LA 70504		
Co-Chair	L. Antonio Estévez, Department of Chemical Engineering, University of Puerto Rico, College of Engineering, Call Box 9000, Mayaguez, PR 00681-9000		
23B03 Deve	lopments in Biobased Alternative Fuels		
Chair	Brian Duff, Office of the Biomass Program, U.S. Department of Energy, 1617 Cole Blvd., Golden, CO 80401		
Co-Chair	Marcus Rajchel, Clarke-Rajchel Engineering, 12803 W. 84th Place, Arvada, CO 80005		
_	rated Processes for Biochemical Conversion of Renewable Feedstocks to Fuels and		
Chemicals Chair	Alexandre Chapeaux, National Bioenergy Center, National Renewable Energy Laboratory, 1617 Cole Blvd, Golden, CO 80401		
23B05 Life (Cycle Analysis of Bio-Based Fuels, Energy, and Chemicals		
Chair	Ignasi Palou-Rivera, Argonne National Laboratory, 9700 S Cass Ave, Argonne, IL 60439		
Co-Chair	Paul Blowers, Chemical and Environmental Engineering, The University of Arizona, PO Box 210011, Tucson, AZ 85721-0011		
23B06 Adva	23B06 Advances in Biofuels: DOE Bioenergy Research Centers		
Chair	Venkatesh Balan, Chemical Engineering and Material Science, Great Lakes Bioenergy Center, Michigan State University, Lansing, MI 48910		
Co-Chair	Seema Singh, Joint BioEnergy Institute, Emeryville, CA 94608 and Sandia National laboratories, Livermore, CA, Emeryville, CA 94608		
23B07 Plena	ry Session: Sustainable Biorefineries		
Chair	Nathan Mosier, LORRE / Agricultural and Biological Engineering, Purdue University, 500 Central Drive, Potter Building, W. Lafayette, IN 47907		
Co-Chair	Sipho C. Ndlela, Ames Iowa		
	•		

23B08 Biofuels Production: Design, Simulation, and Economic Analysis			
Chair	Ramalingam Subramaniam, Chemical Engineering, University of Louisiana at Lafayette, 131 Rex Street, Lafayette, LA 70504		
Co-Chair	Mark Mba Wright, Iowa State University, Ames Iowa		
23B09 Adva	23B09 Advances in Algal Biorefineries		
Chair	Belinda S.M. Sturm, Department of Civil, Environmental & Architectural Engineering, University of Kansas, Lawrence, KS 66045		
Co-Chair	Stephen Dufreche, Chemical Engineering, University of Louisiana at Lafayette, 131 Rex St., 217A Madison Hall, Lafayette, LA 70504		
23B10 Conv	23B10 Conversion of Biomass Based Renewable Resources to Synthesis Gases and Pyrolysis Oils		
Chair	Fernando Resende, School of Environmental and Forest Sciences, University of Washington, 290 Bloedel Hall, Seattle, WA 98195		
Co-Chair	Ezra Bar Ziv, Mechanical Engineering-Engineering Mechanics, Michjigan Technological University, Houghton, MI 49931		
23B11 Biological Conversions and Processes for Renewable Feedstocks			
Chair	Shishir Chundawat, Chemical Engineering and Material Science, Great Lakes Bioenergy Center, Michigan State MI 48910		
Co-Chair	Hasan K. Atiyeh, Biosystems and Agricultural Engineering, Oklahoma State University, 227 Agricultural Hall, Stillwater, OK 74078-6021		
23B12 React	23B12 Reaction Kinetics and Transport Fundamentals for Biomass Conversion		
Chair	Todd A. Lloyd, Mascoma Corporation, 67 Etna Road; Suite 300, Lebanon, NH 03766		
Co-Chair	Jonathan Stickel, National Bioenergy Center, National Renewable Energy Laboratory, 1617 Cole Blvd., MS 1608, Golden, CO 80401		
23B13 Life (Cycle Assessment of Advanced Biofuels		
Chair	David Shonnard, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931		
23B14 Poste	r Session: Sustainability and Sustainable Biorefineries		
Chair	Susan M. Stagg-Williams, Chemical & Petroleum Engineering, University of Kansas, 1530 W, 15th Street, 4132 Learned Hall, Lawrence, KS 66045		
Co-Chair	Mark Mba Wright, Iowa State University, Ames Iowa		
23B15 React	tor Engineering for Biomass Feedstocks		
Chair	Michael J. Antal, Hawaii Natural Energy Institute, University of Hawaii, 1680 East-West Road, POST 112C, Honolulu, HI 96822		
Co-Chairs	Yukihiko Matsumura, Hiroshima University, 1-4-1 Kagamiyama, Higashi-hiroshima-shi, Hiroshima 739-8527 Japan		
Co-Chairs	Kazuhiro Mochidzuki, IIS, Univ. of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505 Japan		

23B16 Developments in the Pretreatment of Lignocellulosics for Bioconversion			
Chair	Subramanian Ramakrishnan, Department of Chemical and Biomedical Engineering, Florida A&M University - Florida State University, Tallahassee, FL 32310		
Co-Chair	Tae Hyun Kim, Ag. and Biosystems Engineering, Iowa State University, IA		
23B17 Chem	23B17 Chemical and Catalytic Conversions and Processes for Renewable Feedstocks		
Chair	Hongfei Lin, Chemical and Materials Engineering, University of Nevada, Reno, Reno, NV 89557		
Co-Chair	Michael Mullins, Department of Chemical Engineering, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931		
23B18 Elect	rofuels Science and Engineering		
Chair	Brian Duff, Office of the Biomass Program, U.S. Department of Energy, 1617 Cole Blvd., Golden, CO 80401		
Co-Chair	Rafael Hernandez, Department of Chemical Engineering, University of Louisiana at Lafayette, Lafayette, LA 70504		
23C00 Energy Sustainability, Challenges and Solutions			
Chair	William M. Barrett, US Environmental Protection Agency, 26 W Martin Luther King Dr, MS-445, Cincinnati, OH 45268		
Co-Chair	Helen H. Lou, Dan F. Smith Department of Chemical Engineering, Lamar University, 4400 MLK Blvd., P.O. Box 10009, Beaumont, TX 77710		
23C00 Conc	entrated Solar for Power Generation and Chemical Processing		
Chair	Alexandre F.T. Yokochi, School of Chemical, Biological and Environmental Engineering, Oregon State University, OR 97331-2702		
Co-Chair	Wojciech Lipinski, ANU College of Engineering and Computer Science, Australian National University		
23C01 Susta	inable Electricity: Generation and Storage		
Chair	Da Deng, Chemical Engineering and Materials Science, Wayne State University, Detroit, MI 48202		
Co-Chair	Fengqi You, Department of Chemical and Biological Engineering, Northwestern University, 2145 Sheridan Road, Evanston, IL 60208-3120		
23C02 Susta	inable Fuels		
Chair	Shaibal Roy, Du Pont Engineering Research & Technology, Wilmington, DE 19898		
Co-Chair	Christian M. Lastoskie, Civil & Environmental Engineering, University of Michigan, Ann Arbor, MI 48109-2125		
23C03 Susta	inability of Fossil Fuels		
Chair	Ignasi Palou-Rivera, Argonne National Laboratory, 9700 S Cass Ave, Argonne, IL 60439		
Co-Chair	Fengqi You, Department of Chemical and Biological Engineering, Northwestern University, 2145 Sheridan Road, Evanston, IL 60208-3120		

23C04 CO2 Capture and Sequestration	
Chair	Urmila D. Diwekar, Vishwamitra Research Institute, 368, 56th Street, Clarendon Hills, IL 60514
Co-Chairs	Debangsu Bhattacharyya, Department of Chemical Engg., West Virginia University, P.O Box 6102, Morgantown, WV 26506
Co-Chairs	Fengqi You, Department of Chemical and Biological Engineering, Northwestern University, 2145 Sheridan Road, Evanston, IL 60208-3120

Education Column

By Alex Yokochi

Support the activities of the SEF!



As members of the Institute our work most likely focuses on processes related to the conversion of human activity. Therefore we are responsible for ensuring that we

(that's the collective "we" as in all of humanity) have and will continue to have sufficient water, energy, materials, and finished products to support a high quality of life.

Coupling this with the concept of sustainability, essentially the idea of creating conditions that will enable us to maintain conditions under which this high quality of life can be maintained to an indefinite future, Sustainable Engineering is therefore focused on the creative application of Sustainability Science on the design and improvement of technologies that will enhance our system sustainability whether by decreasing impacts of present activities or mitigating impacts of past activities. Clearly, sustainability forms a part of the ethical responsibility of engineering in general, and most of our innovation activities include some sustainability component, whether explicit, or implicit. In light of the present call for papers for the AIChE annual meeting I would like to challenge you to

clearly present in both abstracts and presentations the manner in which your work addresses sustainability.

For any comments or with ideas on what I can address in upcoming Education Columns, please contact me at alex.yokochi@orst.edu.

IfS Updates

By Darlene Schuster and Lucy Alexander

Enroll Today for the AIChE Credential for Sustainability Professionals

The AIChE Credential for Sustainability Professionals (ACSP) is being launched to offer practicing engineers, faculty and graduate students a specialized credential in sustainability. The program comprises an online self-assessment, 2 master level courses, and a capstone case study design project. The ACSP is now open for enrollment to all interested applicants. To register for the first class, take the prescreen assessment at:

 $\underline{\text{http://www.aiche.org/ifs/resources/sustainability-credentials.}}$

RCN Conference on Pan American Biofuels and Bioenergy Sustainability

Register now for the Conference on Pan American Biofuels and Bioenergy Sustainability, hosted by the NSF PanAm RCN with AIChE, IfS and SBE on July 22-25, 2014 in Recife, Brazil. A diverse network of biofuels sustainability professionals will focus on a range of sustainability issues in the Pan-American region. Deliverables from this conference include a

Research Roadmap Report to integrate and guide future research priorities and processes, and a graduate course on biofuels and bioenergy sustainability. To register, please visit:

http://www.aiche.org/panamrcn/events/rcn-conference-on-pan-american-biofuels-and-bioenergy-sustainability

Sustainable Packaging Cosmetics Roundtable (SPCR)

The Sustainable Packaging Cosmetics Roundtable (SPCR), with members from major cosmetics companies, organized under the <u>Center</u> for Sustainable Technology Practices (CSTP) of

AIChE's Institute for Sustainability, enters its third year of operation. SPCR members work with suppliers, retailers and customers to



advance sustainable packaging. Their latest effort is the development of the Sustainable Materials Commodity Guide – a comprehensive list of packaging suppliers' sustainability attributes. To browse corporate members of CSTP or to get involved, please visit:

http://www.aiche.org/ifs/community/overview/corporate-members

DOE Sustainability Metrics

AIChE's Institute for Sustainability and Center for Energy Initiatives are developing a suite of sustainability metrics for manufacturing systems to be implemented in sensor data technologies being developed by the Smart Manufacturing Leadership Coalition (SMLC) and funded by a DOE grant to achieve energy productivity gains. Efforts are also underway to explore development of education modules with novel approaches using Cloud data storage and apps for real time engineering and process control for manufacturing. To learn more, please visit:

http://www.aiche.org/cei/news/institute/07-31-2013/industrial-scale-demonstration-smart-manufacturing

Members' Column

By Cory Jensen

Not a member of AIChE or the Sustainable Engineering Forum? In order to guarantee that you are on the current email list and will have access to all existing SEF materials, please follow the link and make sure that you join the SEF!

https://www2.aiche.org/SolutionSite/default.aspx? tabid=168&action=MBRProductDetails&args=35 &aicheskin=aiche

We are an active group of 500+ members ranging from industry to academia. The diverse interests of our members have contributed to the range of activities which we offer through the forum. As a member, you will be placed on our e-mailing list and notified of upcoming meetings and events.

Three Steps to Membership

- 1. Applicant's Request for Membership
 - 1. Complete the SEF Application available online at:

www.aiche.org/DivisionsForms/ViewAll/SEF.as px

- REGULAR membership annual fee \$20
- STUDENT membership annual fee \$10

Membership fee waived for full-time undergraduate or graduate students for two years provided that student is a paid AIChE member; otherwise, a \$10 annual fee is required. Mail completed forms to:

AIChE Customer Service, 3 Park Avenue, New York, NY 10016

- 2. 2. Staff Review to ensure completeness of application
- 4. 3. Membership Welcome!

3.

SEF Leadership 2014-2015

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SEF Leadership 2014-2015

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