

8th International Conference on Foundations of Computer Aided Process Design (FOCAPD 2014)

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Meeting Facilitator: Robin Craven, Smart Meetings

Schedule: July 13 – 17, 2014 (Sun – Thurs)

Venue: Suncadia Resort, Cle Elum, WA

URL: www.focapd.org/wordpress

EXECUTIVE SUMMARY

It was our great pleasure and privilege to organize the 8th International Conference on the Foundations of Computer-Aided Process Design (FOCAPD 2014), held at the Suncadia Resort in Cle Elum, Washington, USA, July 13-17, 2014. The FOCAPD series are the premier international conferences focusing exclusively on the fundamentals and applications of computer-aided design for the process industries. Held every five years, FOCAPD 2014 was the eighth in this series, and brought together researchers, educators and practitioners to identify new challenges and opportunities for process and product design. In the context of the conference theme “Innovation for Sustainability at the Interfaces of Process and Product Design” we solicited papers that emphasize the impact of computer-aided design on sustainability both within traditional chemical processes and at the interface of traditional processes with non-traditional areas.

A total of 154 delegates from 23 countries traveled to Cle Elum, WA to participate in FOCAPD 2014 and included 35 representatives from industry and government as well as 52 students.

We are indebted to our conference manager, Mrs. Robin Craven, along with the staff at Suncadia Resort for all of their hard work. We would also like to acknowledge Mr. Brennen Reece of Auburn University for his outstanding work in designing and developing all promotional materials for the conference including the website, flyers, name badges, and the program book, which is available on the conference website. Mr. Reece also deserves recognition for providing the musical entertainment during the banquet at Swiftwater Cellars and for his assistance throughout the conference. Finally, we appreciate the support from the CACHE Corporation and the AIChE Computing and Systems Technology (CAST) Division.

We are very grateful for the financial support provided by the conference sponsors: the National Science Foundation, AIChE Sustainable Engineering Forum, AspenTech, the Auburn University Samuel Ginn College of Engineering, Bryan Research & Engineering, Eastman Chemical Company, Evonik Industries, ExxonMobil, Honeywell/UOP, and SimSci by Schneider Electric. These funds were used to ensure reduced registration fees for students, free accommodation for the duration of the conference for all junior researchers including students, postdocs, and junior faculty (71 in total), as well as the Best Contributed Paper Awards.

1. BACKGROUND

FOCAPD has been the premier conference in the area of chemical process design for more than 30 years. The complete list of FOCAPD conferences is provided below:

- 1980 Henniker, NH W.D. Seider and R.S.H. Mah
- 1983 Snowmass, CO A.W. Westerberg and H.H. Chien
- 1989 Snowmass, CO J.J. Siirola, I.E. Grossmann, and G. Stephanopoulos
- 1994 Snowmass, CO L.T. Biegler and M.F. Doherty
- 1999 Breckenridge, CO M.F. Malone and J.A. Trainham
- 2004 Princeton, NJ C.A. Floudas and R. Agrawal
- 2009 Breckenridge, CO M.M. El-Halwagi and A.A. Linninger
- 2014 Cle Elum, WA M.R. Eden, J.D. Siirola, and G.P. Towler

The chemical industry is entering a new phase of rapid evolution. The availability of low-cost feedstocks from natural gas is causing renewed investment in basic chemicals, while societal pressures for sustainability and energy security continue to be key drivers in technology development and product selection. This dynamic environment creates opportunities to launch new products and processes and to demonstrate new methodologies for innovation, synthesis and design.

FOCAPD 2014 fostered constructive interaction among thought leaders from academia, industry, and government and provided a showcase for the latest research in product/process design.

2. MEETING SCOPE AND FORMAT

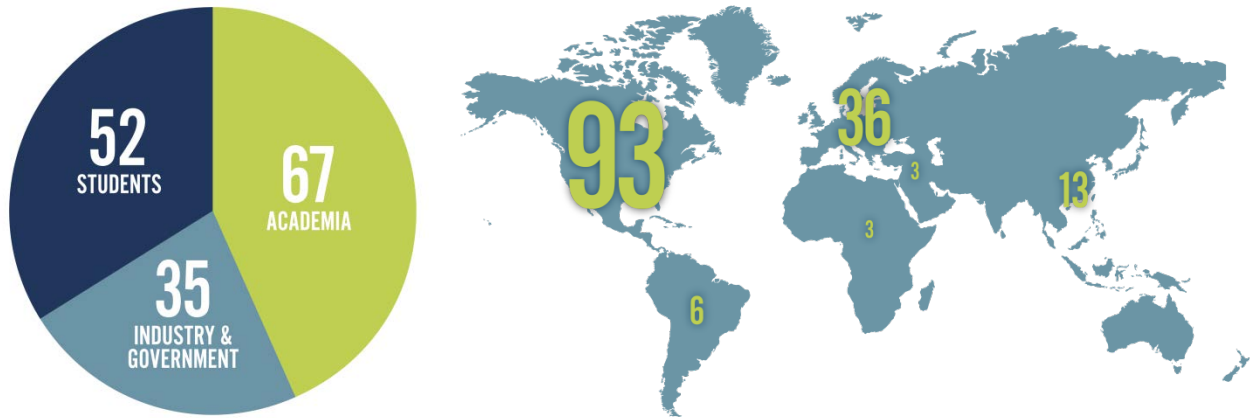
In the context of the theme of the conference “Innovation for Sustainability at the Interfaces of Process and Product Design” we solicited papers that emphasize the impact of computer-aided design on sustainability both within traditional chemical processes and at the interface of traditional processes with non-traditional areas. We encouraged papers from all areas of systems, process, and product design, with particular emphasis on the following areas:

- Design for sustainability and energy efficiency
- Process design and the future smart grid
- Impact and opportunities arising from abundant shale gas
- Design for carbon capture and sequestration
- Design of non-traditional energy systems
- Design of sustainable supply chains
- Advances in process intensification
- Integration of risk modeling, uncertainty quantification, and process design
- Future process and product design education
- Bio- and pharmaceutical process design
- Design for safety
- Integration of dynamics, controllability, and process design
- Emerging tools for product and process design

The conference program featured 33 invited plenary lectures and 96 contributed poster presentations. The contributed papers were allocated to three separate, non-overlapping and extremely well attended poster sessions to provide ample opportunities for discussion and interaction with the conference participants. On Thursday afternoon, we organized a special session focusing on the future challenges and opportunities within our field. This session featured 8 outstanding junior faculty members from the US, Europe, and Asia and was followed by a very stimulating panel discussion.

3. TARGET AUDIENCE AND PARTICIPANTS

The primary goal of FOCAPD-2014 was to create an academic and industrial dialogue, a critical assessment of existing enabling technologies, a discussion on research, education, industrial needs, and a forum for new directions, challenges and opportunities in product and process design. The 154 participants were a mix of academics and industrial practitioners with 43% from academia, 23% from industry and government, and 34% students. 60% of the attendees came from the US, 23% from Europe, 9% from Asia, and the remaining 8% from South America, Africa and the Middle East.



Our graduate students and postdoctoral associates form the next generation of researchers and it was of primary importance to attract these individuals to the FOCAPD-2014 conference. To achieve this goal, reduced registration fees were provided for graduate students and postdoctoral associates. We also wanted to highlight the work of these individuals, and as such increased the number of contributed paper sessions so that no more than one-quarter of the attendees were presenting in any session, thereby providing significant opportunity for all attendees to interact with all paper presenters.

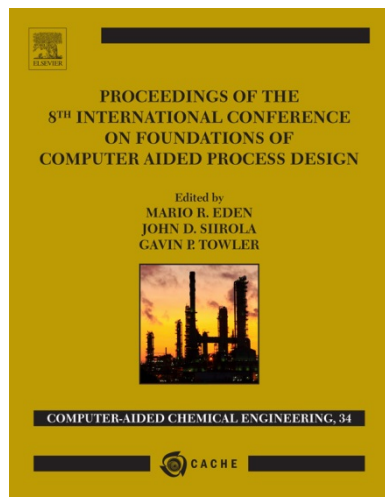


4. PROCEEDINGS

All papers (plenary and contributed) were peer-reviewed by members of the International Programming Committee, as well as by other select reviewers. All accepted invited (23) and contributed papers (96) were included in the proceedings as part of the Elsevier book series *Computer-Aided Chemical Engineering*:

- Eden M.R., Siirola J.D., Towler G.P. (2014): "Proceedings of the 8th International Conference on Foundations of Computer-Aided Process Design", *Computer-Aided Chemical Engineering* (34), pp. 1-816, ISBN 978-0-444-63433-7, Elsevier.

This provides a fully archival and indexed record of the conference. This aligns the FOCAPD meeting with the other major design conferences, i.e. the ESCAPE and PSE series, which both publish their proceedings as part of this book series.



The publication of a fully archival conference proceedings is a point of particular pride for the conference chairs and sets a precedent for future meetings. The proceedings volume was provided to all participants as an eBook prior to the conference and is indexed on Scopus, Science Direct and ISI Web of Science. In addition, approximately 30 full length papers from the conference will be published in a special issue of *Computers and Chemical Engineering* around July 2015. The draft manuscripts are currently under review and we anticipate that the final papers will be submitted to Elsevier by April 1, 2015.

5. VENUE

FOCAPD 2014 was held at the Suncadia Resort in Cle Elum, WA on the sunny eastern slopes of the Cascades, 85 miles from Seattle, Washington. The resort offered outdoor recreation, luxurious accommodations and amenities, and state-of-the-art facilities.



6. FINANCIAL SUPPORT

In addition to \$40,000 in support from the National Science Foundation, we raised a total of \$37,500 from external sponsors (the AIChE Sustainable Engineering Forum, AspenTech, the Auburn University Samuel Ginn College of Engineering, Bryan Research & Engineering, Eastman Chemical Company, Evonik Industries, ExxonMobil, Honeywell/UOP, and SimSci by Schneider Electric) to cover the difference between the actual cost and the reduced registration fees for students and postdocs as well as the Best Contributed Paper Awards. The NSF support, supplemented with industrial contributions, allowed us to

provide free accommodation for the duration of the conference for all junior researchers including students, postdocs, and junior faculty (71 in total). The registration fee charged to all conference attendees covered:

- Opening reception and hospitality
- Light breakfast (4x)
- Lunch (4x)
- Conference Banquet
- Refreshments during breaks (6x)
- Dessert and hospitality during and after poster sessions (3x)
- Proceedings volume as eBook

7. CONTRIBUTED PAPER AWARDS

The session chairs for the three poster sessions identified the best contributed paper along with two honorable mentions. The awards consisted of engraved plaques for all co-authors and a cash prize.

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| Best Paper | D.K. Babi, J. Holtzbruegge, P. Lutze, A. Gorak, J.M. Woodley, R. Gani <i>Sustainable Process Synthesis-Intensification</i> |
| Honorable Mention | J. Shin, S. Cremaschi <i>Data Clustering for Uncertainty Reduction – A Case Study of Solids Transport in Oil/Gas Pipelines</i> |
| Honorable Mention | S.M. Sen, J. Han, J.S. Luterbacher, D.M. Alonso, J.A. Dumesic, C.T. Maravelias <i>Synthesis of Catalytic Biomass-to-Fuels Strategies</i> |

8. FEEDBACK FROM PARTICIPANTS

Following the conference an online survey consisting of 24 questions was distributed to all participants. A total of 77 of the 154 participants completed the survey (50%) with the demographic distribution closely following the conference itself in terms of invited speakers, poster presenters, and industrial/academic attendees. In addition to the numerical results, the participants were asked to provide comments on various aspects of the conference including organization and venue. Numerous very positive comments were received along with constructive suggestions for future meetings that will be passed along to the organizers of FOCAPD 2019. Below is a summary of the most important survey questions.

- 98.4% felt the conference *Met or Exceeded Expectations* (60.3% answered *Exceeded*)
- 98.4% rated invited presentations *Good – Excellent* (95.2% answered *Excellent* or *Very Good*)
- 98.4% rated poster presentations *Good – Excellent* (82.5% answered *Excellent* or *Very Good*)
- 100% rated the organization *Good – Excellent* (93.4% answered *Excellent* or *Very Good*)
- 100% rated the archival proceedings *Good – Excellent* (91.8% answered *Excellent* or *Very Good*)
- 100% rated overall value for money *Good – Excellent* (75.8% answered *Excellent* or *Very Good*)

Overall, we feel that FOCAPD 2014 was a great success as indicated by the post-conference survey results above along with the numerous favorable and complimentary comments made by the attendees both during the meeting itself and as part of the extemporaneous parts of the survey. The participants seemed most appreciative of the opportunities for informal discussions and networking, the quality of the speakers and the poster sessions, as well as the beautiful facilities.