

# AIChE Process Development Division Fall Newsletter 2023



For more information, visit

<http://www.aiche.org/community/sites/divisions/process-development>

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## Fall Newsletter:

As usual, our Fall 2023 edition centers around activities planned at the Annual Meeting, scheduled for November 5 – 10 in Orlando, Florida this year. You will find information on division specific activities as well as some general programming information. We hope you are planning to attend and that we'll see you there at the PDD events.

This year's fall meeting also marks the changeover of the PDD Chair position. We welcome the incoming Chair, Kishori Deshpande, and thank outgoing Chair, Qiang Xu, for his service over the past two years. Both incoming and outgoing chairs offer their thoughts on the division and the transition in this newsletter.

You will also find information on our fall PDD award winners, the upcoming 2024 Process Development Symposium, the PDD Webinar Series, and other division highlights and opportunities to volunteer in division activities. Please consider becoming engaged in these opportunities and encourage your colleagues with similar interests to join our group.

Have a great fall, and we hope to see you in Orlando or at the Spring meeting in New Orleans next year.

### **Please Join: Process Development Division (PDD)**

The Process Development Division promotes networking and communication amongst engineers and scientists interested in process development. The division sponsors meetings, dinners, seminars, technical programming, and publications. The division provides a forum for the engineer and educator to exchange information and ideas related to process development. Please join or encourage your colleagues to join if they are not already members.

**Chartered 2000, Annual Dues: \$10**

## Letter from the Outgoing Chair:

Dear PDD members:

Time flies like an arrow. My term as Division Chair is ending this year. I am very proud, honored, and blessed to represent and serve the division that has done so much for the promotion of networking and communication among chemical engineers, scholars, and scientists interested in process development. In the past two years, our division has provided excellent sessions at annual Spring and Fall Meetings, sponsored two Process Development Symposia, honored outstanding PDD awardees, issued three annual PDD newsletters (special thanks to Rob Nunley), conducted three PDD webinars, and organized annual routine PDD meetings and dinners. In the meantime, thanks to Kishori Deshpande and Mary Am Ende for their great efforts, and thanks to all other division and area leadership for their volunteer contributions, we are nearing the completion of our division's bylaw update. Kishori will be taking over as Division Chair for 2024-2025. Many thanks, Kishori, for your excellent work as Chair Elect. We look forward to your leadership in the next two years.

For those of you attending the Annual meeting, I encourage you to attend our PDD General/Leadership Meeting on Monday (Nov. 6), PDD Programming Meeting on Tuesday (Nov. 7), as well as our PDD dinner on Tuesday night to participate in our PDD management, get to know each other, and offer volunteering help to our division. Finally, I would like to thank all of you again for being members of the division and continuing your great support in the future.

Should you have any questions, please feel free to contact me.

Best regards,

Qiang

Qiang Xu

Professor

University Professor & Scholar Distinguished Faculty Research Fellow

Dan F. Smith Department of Chemical & Biomolecular Engineering

Lamar University, Beaumont, TX 77710

Tel: (409) 880-7818; Email: [Qiang.xu@lamar.edu](mailto:Qiang.xu@lamar.edu)



## Letter from the Incoming Chair:

Dear PDD members:

I am honored to take over as the Chair of the Process Development Division starting this Fall. To me, the division represents the finest of chemical engineers and scientists practicing various aspects of process design and scale-up of commercial processes. I have been involved with this division for the past six years in various capacities including a volunteer, session chair, and chair elect. In all these roles I have witnessed the division's exceptional efforts to promote networking and communication among engineers and scientists interested in process development through meetings, seminars, courses, and publications.

As the chair, I plan to support initiatives that my predecessor, Dr. Qiang Xu, initiated including the webinar series, by laws update, as well as the quarterly division meetings. I am particularly excited about the webinar series since it allows the division members to learn about the latest developments in the field of process development while serving as a forum for engineers and educators to exchange information and ideas. As part of this series, we got the opportunity to listen to experts in the field including Dr. Yinlun Huang, Dr. Cheryl Teich, and Dr. Joseph Powell. We have an exciting line-up of speakers in the coming months! So please stay tuned.

This year, we started a new initiative to enable young professionals seeking industrial job opportunities to showcase their expertise through the "Meet the Industry Candidate" poster session at the AIChE Annual conference. I encourage you all to stop by this poster session on November 7th in Regency Ballroom to encourage and guide the young professionals as they enter the job market. I sincerely hope that you will join us for all the events that we have planned for you!

If you want to learn more about our other initiatives or ways to get involved, please contact me or the leadership team members.

I am thankful for this opportunity to serve the division and am looking forward to this exciting journey!

Best wishes,

Kishori Deshpande, Ph.D.

Dow

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## 2023 PDD Annual Meeting Events

### **PDD Leadership & General Meeting**

Monday, November 6, 6:15 – 7:15 PM

Hyatt Regency Orlando – Bayhill 27 (Lobby Level)

<https://aiche.confex.com/aiche/2023/meetingapp.cgi/Session/53791>

### **PDD Programming Meeting**

Tuesday, November 7, 10:45 – 11:45 AM

Hyatt Regency Orlando – Bayhill 18 (Lobby Level)

<https://aiche.confex.com/aiche/2023/meetingapp.cgi/Session/53793>

### **PDD Dinner (Ticketed Event)**

Tuesday, November 7

Cuba Libre Restaurant

See more information on the following page

Division meetings are great places to get involved in division activities. Please attend or reach out to PDD leadership listed at the end of this newsletter if you are looking for opportunities to become more involved.

## Process Development Division Dinner



**Cuba Libre Restaurant**  
9101 International Drive  
Orlando, FL

**Tuesday, November 7**

**Dinner 7:30 PM: Ticketed Event: \$75**

**Free Reception for PDD Members 6:30 – 7:30 PM**

Please join us for an evening of dining and conversation within walking distance of the Convention Center. The dinner is always a PDD highlight of the AIChE meetings and is a great time to meet fellow members. This is a ticketed event. Tickets can be purchased through AIChE prior to the event or at the registration desk upon arrival. Seating is limited, so get your tickets early.

Photo Credits: Cuba Libre Restaurant, Google



## Process Development Division Awards

The following awards will be presented at the PDD Dinner at the Annual Meeting.  
Congratulations to our award winners.

### PDD Student Paper Award Sponsored by The Linde Group



**Ying Liu**  
Lamar University

Ying's research work mainly focuses on production process modeling, simulation, and optimization. In this work, a conceptual design for a super industrial complex (termed A<sup>3</sup>U) that utilizes natural gas for electricity generation, fertilizer production, and carbon capture has been developed. It integrates four subsystems: air separation, Allam-cycle power plant, ammonia production, and urea production. By efficiently integrating material and energy streams, the A<sup>3</sup>U complex can economically produce net power, urea fertilizer, CO<sub>2</sub>, nitrogen, and low-pressure steam. Notably, it boasts low emissions of CO<sub>2</sub> and no NO<sub>x</sub> emissions during manufacturing. The large-scale modeling and simulations demonstrate the economic and environmental benefits, which outperform normal standalone processes.

## Excellence in Process Development Research Award

Sponsored by Pfizer

Masoud Soroush  
Drexel University



M. Soroush has contributed to the advancement of process development via his research and educational activities focusing on polymer manufacturing and renewable energy processes and functional process safety, and in recent years on nanomaterials and *mRNA* manufacturing processes.

**Polymer Processes.** For more than twenty years, in collaboration with DuPont Performance Coatings and then with Axalta Coating Systems, his team has contributed to the development of novel polymer process designs enabling on-demand continuous production of high-quality polymers. Also, in recent years, his team has studied artificial-intelligence-guided manufacturing of paints and coatings (P/C). Machine learning models trained on Axalta's P/C historical data have captured and described poorly understood relationships between P/C quality attributes and process design and operation parameters, enabling *in-silico* P/C product and process design and *real-time* prediction of P/C product quality attributes.

**Renewable Energy Processes.** His team has advanced the design and operation of dye-sensitized solar cells (DSSCs), a class of new solar cells that have shown tremendous promise. The team has studied liquid- and polymer-electrolyte DSSCs, leading to the introduction of novel polymer-electrolyte DSSC designs. The fundamental insights gained from these studies have enabled the optimal design and operation of these fuel cells.

**Functional Process Safety.** Process safety is the foremost non-negotiable objective in the development of every process. The nominee's group introduced a novel framework for functional process safety, termed model-predictive safety (MPS). MPS represents an evolution in functional safety, because unlike conventional functional safety systems, it generates alarm signals that are predictive while systematically accounting for process complexities and uncertainties. It detects potential and imminent future process operation hazards in real time, and it prescribes optimal preventive and mitigating actions proactively while accounting for uncertainties in such elements as the process model and human actions.

**Cybermanufacturing and Modular On-demand Manufacturing of Nanomaterials and *mRNA*.** In recent years, M. Soroush has focused on cybermanufacturing and modular on-demand manufacturing of nanomaterials and *mRNA*. Specifically, his team's studies of the properties of MXenes (novel 2-dimensional nanomaterials) have led to advances in the development of novel processes for industrial-scale manufacturing of the nanomaterials and *mRNA*.

**Undergraduate Research and Education.** M. Soroush's activities focused on process development have also impacted a relatively rarely included population — undergraduate researchers. In addition to supervising 32 undergraduate research projects on manufacturing, he is the director of the National Science Foundation-sponsored **Smart Manufacturing Research Experiences for Undergraduates (SMREU) Site**, which brings 12 undergraduate students from across the U.S. to Drexel for 9 summer weeks every year to gain hands-on experience in cutting-edge research relevant to cyber manufacturing and to interact with national leaders in this field through seminars.

Masoud Soroush is a professor of Chemical and Biological Engineering at Drexel University and the director of the National Science Foundation-sponsored Smart Manufacturing Research Experiences for Undergraduates (SMREU) Site. He received his BS in chemical engineering from Abadan Institute of Technology, Iran, and his MS and PhD in chemical engineering from the University of Michigan, Ann Arbor, where he also earned an MS in electrical engineering. His research deals with advanced manufacturing of novel materials for health, energy, and sustainability; functional safety; and process systems engineering. He is an elected fellow of the AIChE and a senior member of the IEEE. His other awards include the AIChE 2021 Institute Award for Excellence in Industrial Gases Technology, NSF Faculty Early CAREER Award, and American Automatic Control Council 1999 O. Hugo Schuck Best Paper Award.



## 2023 Process Development Symposium



**June 4 – 6, 2024**

**Chicago, IL**

The 2024 Process Development Symposium (PDS) is a place to exchange wisdom, knowledge, tips, and personal experiences in the development and scale-up of chemical and related processes. The PDS provides an opportunity for process development professionals from across the world to discuss their experiences with novel and innovative technologies to trigger radical changes in next-generation processes development and operations. The symposium features presentations from process development professionals and is planned jointly between AIChE and its Process Development Division. The PDS is held annually in June. This year's symposium will take place in Chicago, Illinois on June 4 – 6.

**The Process Development Division is seeking a PDS Liaison to work with AIChE on planning the symposium.** This is an excellent opportunity to volunteer, meet people within PDD and AIChE, get to know other people in the process development profession, and to help shape the content of this high-profile event. If you are interested, please contact Kishori Deshpande ([KDeshpande@dow.com](mailto:KDeshpande@dow.com)) or Cody Hirashima ([codyh@aiche.org](mailto:codyh@aiche.org)).



## Process Development Division

### 2023 Annual Meeting Technical Programming / Sessions

All times are Orlando local time.

#### Sunday, November 5

##### [96 Highly Efficient DOE for Rapid Process Development](#)

3:30 – 6:00 PM: Celebration 6 – Convention Level, Hyatt Regency

##### [183 Process Intensification – Novel Technologies for Carbon Capture and Carbon Recycling](#)

3:30 – 6:00 PM: Bayhill 27 – Lobby Level, Hyatt Regency

#### Monday, November 6

##### [9 Environmentally Friendly Product and Process Development for Sustainability](#)

8:00 - 10:30 AM: Bayhill 28 – Lobby Level, Hyatt Regency

##### [104 Decarbonization for Alkene Production](#)

8:00 - 10:30 AM: Bayhill 27 – Lobby Level, Hyatt Regency

##### [263 Process Development: Design, Risk Reduction, Implementation and Operations](#)

12:30 – 3:00 PM: Bayhill 22 – Lobby Level, Hyatt Regency

##### [320 Decarbonization for Methanol Production](#)

12:30 – 3:00 PM: Bayhill 27 – Lobby Level, Hyatt Regency



## Monday, November 6 - Continued

### 202 Decarbonization for Ammonia Production

3:30 – 6:00 PM: Bayhill 27 – Lobby Level, Hyatt Regency

### 368 Panel Discussion and Speed Networking: Chemical Process and Product Design Careers in Industry & Academia

3:30 – 6:00 PM: Bayhill 22 – Lobby Level, Hyatt Regency

### Process Development Division Leadership and General Meeting

10:45 – 11:45 AM: Bayhill 27 – Lobby Level, Hyatt Regency

## Tuesday, November 7

### 42 Laboratory and Pilot Plant Safety

8:00 – 10:00 AM: Bayhill 28 – Lobby Level, Hyatt Regency

### 132 Sustainability in the Pharmaceutical Industry (Invited Talks)

8:00 – 10:30 AM: Celebration 6 – Convention Level, Hyatt Regency

### 277 Decarbonization for Hydrogen/Chemicals Production and CO<sub>2</sub> Valorization

8:00 – 10:30 AM: Bayhill 27 – Lobby Level, Hyatt Regency

### Process Development Division Programming Meeting

10:45 – 11:45 AM: Bayhill 18 – Lobby Level, Hyatt Regency

### 54 Experiences in Teaching Process Safety

12:30 – 3:00 PM: Bayhill 29 – Lobby Level, Hyatt Regency

### 142 Materials and Processes for Water Purification and Desalination

12:30 – 3:00 PM: Bayhill 28 – Lobby Level, Hyatt Regency



## **Tuesday, November 15 - Continued**

### 143 Process Research for Improved Throughput & Efficiency and Reduced Cost

12:30 – 3:00 PM: Bayhill 27 – Lobby Level, Hyatt Regency

### 337 Meet the Industry Candidates Poster Session: Process & Product Development and Manufacturing in Chemicals & Pharmaceuticals

1:00 – 3:00 PM: Regency Ballroom R/S – Convention Level, Hyatt Regency

### 712 Process Electrification Panel: Co-Organized by EPIXC

3:30 – 4:30 PM: Windermere Ballroom W – Convention Level, Hyatt Regency

### 231 Manufacturing Technology Improvements for Chemical/Energy Industries

3:30 – 6:00 PM: Bayhill 27 – Lobby Level, Hyatt Regency

### 339 Integrated Process Engineering and Economic Analysis

3:30 – 6:00 PM: Bayhill 18 – Lobby Level, Hyatt Regency

### 713 Process Electrification Roundtable Discussions: Co-Organized by EPIXC

4:30 – 6:00 PM: Windermere Ballroom W – Convention Level Hyatt Regency

### Process Development Division Dinner – TICKETED EVENT

7:30 – 10:30 PM: Cuba Libre Restaurant



## Wednesday, November 16

### 76 Challenges and Best Practices in Technology Commercialization I

8:00 – 10:30 PM: Bayhill 27 – Lobby Level, Hyatt Regency

### 164 Process Intensification – Novel Reactors

8:00 – 10:30 AM: Bayhill 28 – Lobby Level, Hyatt Regency

### 82 Process Intensification – Novel Integration Concepts

12:30 – 3:00 PM: Bayhill 28 – Lobby Level, Hyatt Regency

### 76 Challenges and Best Practices in Technology Commercialization II

12:30 – 3:00 PM: Bayhill 27 – Lobby Level, Hyatt Regency

### 238 Crystallization and Precipitation of Pharmaceutical and Biological Molecules

12:30 – 3:00 PM: Manatee Spring II – Lobby Level, Hyatt Regency

### 483 In the Spirit of Innovation

12:30 – 3:00 PM: Challenger 38/39 – Hyatt Regency

### 85 Poster Session: Process Development

3:30 – 5:00 PM: Regency Ballroom R/S – Convention Level, Hyatt Regency





## 2024 Spring Meeting

March 24 – 28

New Orleans Ernest N. Morial Convention Center  
New Orleans, Louisiana



The upcoming 2024 Spring Meeting and 20<sup>th</sup> Global Congress on Process Safety will be held in New Orleans in March 2024. Mark your calendars and join us for another chance to meet and share ideas.

<https://aiche.confex.com/aiche/s24/prelim.cgi/ModuleProgramBook/0>

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## AIChE PDD Webinar Series

PDD is pleased to extend their webinar series with a presentation from Dr. Yang Luo. Mark your calendars and plan to join the division for what should be another great session in this series.

### Process Intensification for a Greener Future

**December 7, 2023**

**2:00 PM Central, 3:00 PM Eastern Time Zones**



**Yang Luo, PhD**

R&D Director

Honeywell Advanced Materials

AIChE Fellow

Launched in 2017, the Rapid Advancement in Process Intensification Deployment (RAPID) Institute is the tenth member of the Manufacturing USA network. With a vision towards a sustainable future, RAPID prioritizes the creation of breakthrough technologies that boost the energy efficiency of manufacturing processes and champion the development of modular processes. Since its establishment, RAPID has flourished into a premier hub for process intensification, drawing active participation from industry, academia, and non-profit organizations.

The webinar will delve into the journey of the RAPID Institute, spotlighting its key technology focus areas and significant undertakings. Attendees will gain insights into real-world applications of process intensification principles, exemplifying the improved energy efficiency coupled with reduced carbon footprint. Additionally, the discourse will shed light on harnessing modern digital tools to cultivate sustainable manufacturing processes will be discussed.

Dr. Yang Luo serves as a Senior R&D leader at Honeywell Advanced Materials. She has extensive industrial experiences in innovation strategy, technology roadmap, portfolio management, and process development. Under her leadership, multiple high-impact process technologies were invented, developed, commercialized, and leading to winning offerings in the market.

Dr. Luo is an AIChE Fellow and has been the recipient of numerous accolades. She significantly contributed to the success of the Department of Energy's RAPID Institute operated by AIChE. She has held numerous leadership positions, notably as the Chair of the RAPID Governing Board. She has also co-chaired AIChE educational initiatives, emphasizing the alignment of industrial and academic expectations in Chemical Engineering Education.

### Registration is Free:

Event registration will be posted soon at:

<https://www.aiche.org/community/sites/divisions/process-development>

## Congratulations to PDD's Aaron Sarafinas

Aaron has been awarded the NAMF Award for Excellence and Sustained Contributions to Mixing Research and Practice. NAMF is the North American Mixing Forum and is an AIChE Community. He will present in the NAMF awards session, [90b - "Process Always Comes First" When Successfully Applying Mixing Technology](#), in Orlando, Wednesday, November 8, 3:45 – 4:45PM, Bayhill 31.

In this Special Lecture, Aaron will give a personal reflection on his 40 years in industrial mixing and process development. He will share some examples from his career where mixing was critical to commercial success, give perspectives on the critical connection between process and applied mixing technology, relate his experience with networking as an effective way of managing (and disseminating) technology within a company, and talk about ways to efficiently characterize how mixing affects chemical and physical processes (the Bourne Protocol and more).

If you can't attend in Orlando, Aaron has volunteered to present his talk on March 14, 2024 as part of the PDD Webinar Series.

## PDD Volunteer Opportunities:

### Process Development Symposium Liaison

The division is seeking a volunteer to fill the PDS Liaison role. PDD has a long history with the PDS as it started as a PDD event. The symposium is now organized by AIChE, but PDD maintains close ties to the event and provides leadership for the PDS through the liaison role as well as many of the technical presenters. This is an opportunity to work with PDD leaders, develop AIChE contacts, and meet other process development professionals. If you are interested, please contact Kishori Deshpande ([KDeshpande@dow.com](mailto:KDeshpande@dow.com)) for more details.

### Area Coordinators

This year's fall meeting also marks the transition point for our area leadership. The current chairs will rotate out and the chair elects will transition into the role. The area coordinator role typically moves directly into the chair elect position. This leaves openings in the area coordinator roles that need to be filled, which will normally progress into area chair elect and chair positions over time. Area leaders have responsibilities for ensuring technical sessions are chaired and are being planned properly, but they also have sway in the area programming offered at the spring and fall meetings. If interested, please join us at the leadership / general meeting at the AIChE meeting in Orlando, or contact Kishori Deshpande ([KDeshpande@dow.com](mailto:KDeshpande@dow.com)) to let her know you are interested.

## Process Development Division Leadership Team

	<p><b>Outgoing Chair</b> Qiang Xu Lamar University (409) 880-7818 Qiang.xu@lamar.edu</p>		<p><b>Incoming Chair</b> Kishori Deshpande Dow Chemical (979) 238-5868 KDeshpande@dow.com</p>
	<p><b>Fall Program Chair</b> Vinod Kumar Venkatakrishnan Shell (281) 544-7567 v.venkatakrishnan2@shell.com</p>		<p><b>Spring Program Chair</b> Juben Chheda Shell (281) 544-8232 Juben.chheda@shell.com</p>
	<p><b>Membership Chair</b> Johnathan Lekse NETL (412) 386-7312 Jonathan.Lekse@NETL.DOE</p>		<p><b>Awards Chair</b> Jay Miller Arkema (610) 359-2092 Jay.f.miller@gmail.com</p>
	<p><b>Treasurer</b> Raymond Rooks AVN Corp (304) 720-1037 Raymond.Rooks@avncorp.com</p>		<p><b>Webmaster</b> Pat Heider Dow (989) 636-1923 plheider@dow.com</p>
	<p><b>Past Chair</b> Anthony Cartolano Retired arcartolano@gmail.com</p>		<p><b>Newsletter Editor</b> Rob Nunley AVN Corp (304) 720-6707 Rob.Nunley@avncorp.com</p>

## 2023 PDD Area Leadership

Chair positions to transition at the fall meeting.

Name	Position	E-Mail Address
<b>12A Process Research and Innovation</b>		
Raymond Jian	12A Chair	rjian@sabic.com
Ben Yang	12A Chair Elect	xyang116@umd.edu
Mo Jiang	12A Area Coordinator	mjiang2@vcu.edu
James Marek	12A Past Chair	james.marek@abbvie.com
<b>12B Pilot Plants</b>		
Madhav Ghanta	12B Chair	madhav.ghanta@sabic-hpp.com
Pratik Bhishikar	23B Chair Elect	pbhishikar@zeton.com
Ida (Xue) Chen	23B Area Coordinator	chen2c7ab2@dow.com
Mike Trainor	12B Past Chair	mtrainor@zeton.com
<b>12C/D Technology Transfer &amp; Manufacturing</b>		
Ha Dinh	12C/D Chair	ha.dinh@honeywell.com
Michael Telgenhoff	12C/D Chair Elect	michael.telgenhoff@dow.com
Mrunmayi Kumbhalkar	12C/D Area Coordinator	mkumbhalkar@dow.com
Rob Nunley	12C/D Past Chair	rob.nunley@avncorp.com
<b>12E/F Process Intensification &amp; Microprocess Engineering</b>		
Robert Broekhuis	12E/F Chair	rbroekhuis@sabic.com
Patrick Heider	12E/F Chair Elect	plheider@dow.com
Jing Luo	12E/F Area Coordinator	jluo2@dow.com
Matthaeus Siebenhofer	12E/F Past Chair	m.siebenhofer@tugraz.at
<b>12G Product Design</b>		
Mu Wang	12G Chair	wang.m.13@pg.com
Shaibal Roy	12G Chair Elect	shaibal.roy@fmc.com
Pranav Karanjkar	12G Area Coordinator	pranav.karanjkar@dow.com
Kishori Deshpande	12G Past Chair	kdeshpande@dow.com

## 2024 PDD Liaisons

Ahmed Youssef      YP Liaison      ahmed.youssef@sabic.com

**OPEN POSITION**      **PDS Liaison**      **SEEKING VOLUNTEER(S)**

Mary T. am Ende      CTOC Liaison      mary.t.amende@nalasengineering.com