



# AICHE Process Development Division

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Fall 2013

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## Message from the Chair

Welcome to the Fall 2013 AIChE Process Development Division (PDD) Newsletter. I hope you had a wonderful summer and are now looking forward to a trip to San Francisco for the AIChE Annual Meeting.

This year's Annual Meeting will be held November 3-8, 2013 at the Hilton San Francisco Union Square. This has always been a favorite spot for AIChE Annual Meetings, so I hope you can join us there. This year the Division is sponsoring or co-sponsoring 36 sessions, all located within the Hilton. A complete session listing can be found on pp. 9-10 of this newsletter.

You will no doubt be pleased to know that we are repeating a tradition we started last year, having a Plenary Session for the entire Division. This session will be Monday 8:30 – 11:00 am in room Union Square 22, and will include outstanding papers from all our programming areas. Whatever your particular interests in Process Development may include, you will surely benefit from the Division Plenary Session, so don't miss it!

(Continued on p.2)

## San Francisco – WHAT TO DO?

- Ride the [Cable Cars](#)\* – There are three lines for this famous transportation system. For more information contact the San Francisco Municipal Railway at 415-673-MUNI (6864) or visit [www.sfmta.com](http://www.sfmta.com).
- Cross the Golden Gate Bridge – Explore on foot or by car, bicycle, tour bus or fire engine tour. Travel under the bridge on a bay cruise or soar over it by helicopter or seaplane. For more information about the bridge call 415-921-5858 or visit [www.goldengate.org](http://www.goldengate.org).
- Visit [Alcatraz](#) and [Fisherman's Wharf](#) – Fisherman's Wharf is the most visited section of San Francisco. Enjoy street performers, fresh seafood, and visit the Boudin Museum & Bakery Tour. Visit the sea lion colony on the west side of Pier 39. Alcatraz, the former federal prison, once housed some of the most notorious criminals. Today it's a national park, reachable by a brief boat ride. For more information call 415-981-7625 or visit [www.alcatrazcruises.com](http://www.alcatrazcruises.com).
- Visit [Union Square](#) – The landmark park is the heart of the city and is known for fantastic shopping. and four grand entrance corner plazas bordered by the park's signature palms, the remodeled square captures the unique flavor and beauty of San Francisco. [www.unionsquashop.com](http://www.unionsquashop.com).

## Message from the Chair (Cont.)

The Division's General Meeting will follow the Division Plenary on the Monday at 11:15 am in room Union Square 20. Boxed lunches will be provided for the first 25 attendees. It's time for us to rotate Division leadership, so at the General Meeting we will announce the winners of our on-line elections for Chair-Elect and Treasurer, and will also hold elections for new chairs-elect for all of our programming areas. If you would like to learn more about the inner workings of the Division and would consider volunteering, please come to our General Meeting. You will find that our Division has a wonderful group of people to interact with!

Our Programming Meeting will be that same afternoon in the same room (Union Square 20) at 5:45 pm. The Programming Meeting is our chance to finalize ideas and chose session chairs and co-chairs. So if you can volunteer to be a session chair or co-chair, or if you have an idea for a future session and are willing to be the chair or co-chair, please come to the Programming Meeting and volunteer.

The Division will host an open bar reception on the Tuesday at 5:45 pm in the Vista Room at the Hilton. We are happy to continue providing this as a free event to all Process Development Division members. This is a fantastic opportunity to meet people and network, so please meet us there!

Following the reception at 7:00 pm will be the Process Development Dinner at Zingari Ristorante, 501 Post Street, just a short walk from the Hilton. Featuring contemporary dishes and cuisines from all regions of Italy, this restaurant is self-described as "a special place where people come to enjoy great food that is authentic, an ambiance that is warm and exciting, service that is friendly and professional, and music that keeps you a little longer than had anticipated." Sounds inviting, no? The Dinner is priced at \$70 and advanced registration through AIChE is required. Division members frequently describe our Division Dinner as one of the highlights of the Annual Meeting, so please join us! At this year's dinner it will also be my privilege to entertain you with a slide presentation on the Changing Face of Chemical Engineering based on a lecture I give to the freshmen at Columbia. I promise that you will find it to be a fascinating look at the past and present of our profession.

The Call for Papers is still open for next year's Spring Meeting, to be held in New Orleans, LA, between March 30 and April 3. Can you submit a paper? Don't miss the opportunity to build your professional network by being there!

Finally, let me say that this is my final letter as Chair of the Division, as John Peragine of BMS takes over as Division Chair following the Annual Meeting. It has been my privilege to be the Chair for the past two years. With your help and support we have streamlined our Division programming processes and meetings, and have added a Division plenary session and an open-bar reception as regular features at AIChE meetings. I have thoroughly enjoyed working with all of you. Not only are we privileged to work in an amazing profession, we are surrounded by a fantastic cadre of people within Process Development Division who are willing to give of themselves for the benefit of all. Thank you to one and all for everything you do!

Best regards,

**Michael Hill**

**Process Development Division Chair**



# Annual Meeting – What you need to know

## Process Development Division (PDD) Dinner

The Process Development Division Dinner provides an excellent opportunity for networking.

**When:** Tuesday, November 5, 2013

**Time:** 7:00 – 9:30 PM

**Where:** Zingari Ristorante (The Terrace Room)

**Address:** 501 Post Street,  
San Francisco, CA 94102

**Phone:** (415) 885-8850

**Contact:** 1-800-242-4363 for details on how to add this ticketed event



## Women Graduate Students Workshop

**(Sunday, November 3, 2013, 9:00am-5:00pm PST)**

Focus on the choices and opportunities available to female graduate students at this full day workshop. The morning session will include a seminar on "Secrets from the Other Side...What Recruiters Know that You Don't" from Dr. Dennis H. Guthrie. (30+ year employee with The Dow Chemical Company where his career has span: Research & Development, Human Resources and Sales & Marketing.

The seminar will be followed by a panel discussion. The afternoon session will feature a seminar from COACH for Scientists.

**This Workshop is priced at \$25 and advanced registration is required.**

## San Francisco Highlights

- Dual-format Poster session:

For the first time, this year's poster sessions will be in hybrid format. It will feature hundreds of high-quality poster presentations, as well as selected electronic poster presentations.

- Pharmaceutical Discovery, Development and Manufacturing Forum
- Advanced Membrane Separation for Sustainability Topical
- Advanced Fossil Energy Utilization Topical
- CO<sub>2</sub> Capture
- Annual Meeting Plenary:

Chemical Engineering Expertise: In Academe and as Sought by Industry

## Become a Sponsor of the AIChE Annual Meeting 2014

### How Do Sponsors Benefit?

- You put your organization in front of a select, elite audience, to powerfully communicate your company's message
- You generate new contacts, and renewed interest for your products
- You demonstrate your company's support for technical excellence as a supplier and employer before this key constituency
- Sponsors can choose from many levels of sponsorship options



### 2013 Chem-E-Car Competition at the Annual Student Conference

AIChE's Annual Student Conference welcomes 31 teams across the United States and Internationally to compete in the Chem E Car Competition.

#### When?

Sunday, November 3, 2013, 1:00pm-3:30pm PST

# PDD Membership Report (By Kevin G. Joback)

## Current Membership

The Process Development Division (PDD) currently has 590 members. Membership has decreased by 23 members or 3.8% since last year. Figure 1 shows the distribution of the membership by age. Tables 1 and 2 show the distribution of the membership by location.

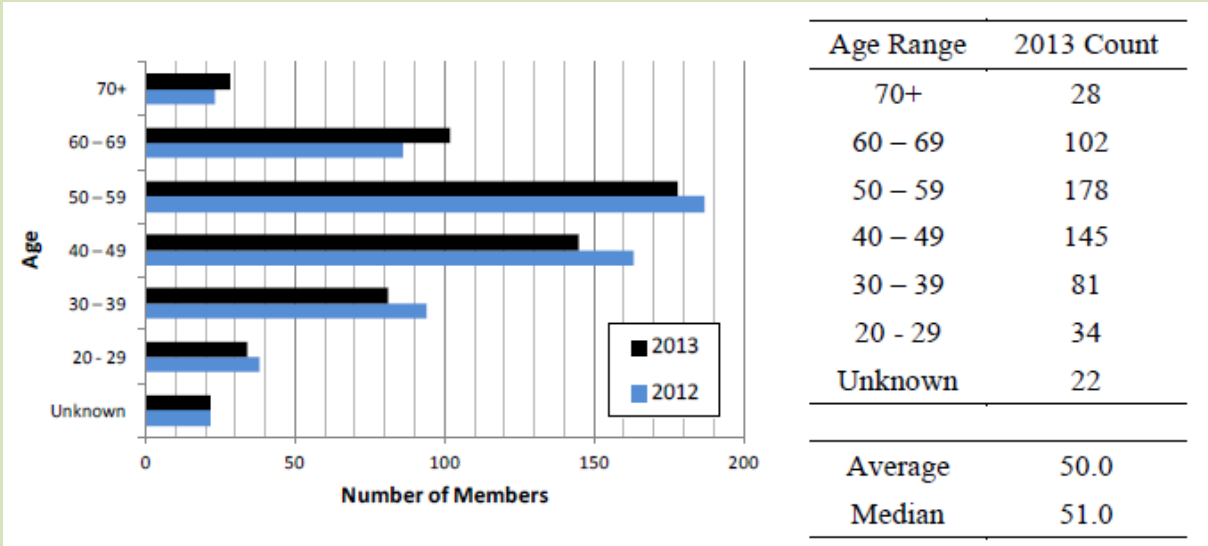


Figure 1: Membership Distribution by Age

Table 1: Membership Distribution by location

	Location	Count	Percentage	Total Percentage
1	Texas	71	12.0	12.0
2	International*	58	9.8	21.8
3	Illinois	41	6.9	28.7
4	Pennsylvania	40	6.8	35.5
5	California	35	5.9	41.4
6	New Jersey	34	5.8	47.2
7	Ohio	27	4.6	51.8
8	New York	21	3.6	55.4
9	Tennessee	20	3.4	58.8
10	Massachusetts	18	3.1	61.9
11	Michigan	18	3.1	65.0
12	Connecticut	17	2.9	67.9
13	Canada	17	2.9	70.8
14	Delaware	16	2.7	73.5
15	Minnesota	14	2.4	75.9
16	Virginia	13	2.2	78.1
17	Colorado	13	2.2	80.3
18	North Carolina	11	1.9	82.2
19	Indiana	11	1.9	84.1
20	Florida	10	1.7	85.8
* Countries excluding the USA and Canada				

## PDD Membership Report (Continued)

**Table 2: International Membership by location**

Location	Count
India	7
Nigeria	4
Malaysia	4
Columbia	4
United Kingdom	3
Japan	3
Mexico	2
Germany	2
Pakistan	2
Trinidad and Tobago	2
Australia	2
Brazil	2
Saudi Arabia	2
United Arab Emirates	2
Countries with 1 member	17

### Meeting Attendance

Table 3 shows the number of annual meetings attended by PDD members in the last three years. Table 4 shows the number of spring meetings attended by PDD members in the last three years. Four hundred and thirty one or 73.1% of the members have not attended either an annual or spring meeting in the last three years.

**Table 3: Annual Meeting Attendance in Last Three Years**

Attendance Category	Count	Percentage
Attended only 1 meeting	52	8.8
Attended only 2 meetings	32	5.4
Attended all 3 meetings	43	7.3
Attended at least 1 meeting	127	21.5

**Table 4: Spring Meeting Attendance in Last Three Years**

Attendance Category	Count	Percentage
Attended only 1 meeting	22	3.7
Attended only 2 meetings	40	6.8
Attended all 3 meetings	36	6.1
Attended at least 1 meeting	98	16.6



## AICHE Annual Student Conference 2013 Recruitment Fair

### ***Bring Your Resume!***

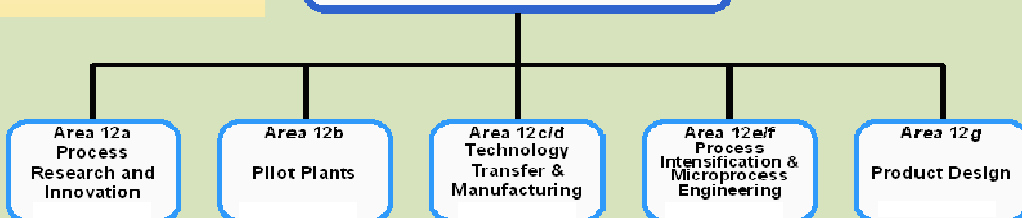
(Sunday, November 3, 2013, 9:00am-4:00pm PST)

Meet Graduate Schools, Recruiters & AIChE  
ScaleUp Sponsors

This exciting event will be your chance to decide which path is best for you after graduation! Representatives of graduate schools and companies from across the country will be on hand to describe their degree programs along with job and internship opportunities. You will learn about current research, new and emerging study options, and interesting venues for continuing your studies and starting your career.



### Process Development Group 12



## FUN FACTS ABOUT SAN FRANCISCO ...

### 1. A city of many names

San Francisco was originally called **Yerba Buena**, a Spanish name meaning “good herb” or “good grass.” “**Baghdad by the Bay**” coined by columnist Herb Caen, and “**The City that Knows How**” are among the common nicknames of the city.

### 2. The city of billionaires

Did you know that San Francisco is one of the **richest cities in the world**? It ranks fourth in the world, after New York, Moscow and London, in terms of the numbers of **billionaires** that call it home. This is despite the fact that it has less than 10% of the population of the other three cities. San Francisco is also known for having the **largest Chinese community in the world**, outside of China.

### 3. The bridge that is too long to paint

An important tourist spot in San Francisco is the **Golden Gate Bridge**. Established in 1937, it is the world’s second longest single span. It links San Francisco with **Marin County** and the **Redwood Empire**. The Golden Gate Bridge is continuously painted and repainted all the time, because the bridge is so long that by the time the **paint crew** gets from one end to the other, it’s time to start over again.

### 4. More facts you never thought you didn’t know

San Francisco is the birthplace of many things that are our today. The **Chinese Fortune Cookie** was invented at the **Japanese Tea Garden** by Makato Hagiwara. **Denim Jeans** were also invented in San Francisco. It was primarily for the use of the **Gold Rush miners** because they needed rough clothes that were comfortable at the same time. **Lombard Street** is not the crookedest street, as is popularly thought to be. It is **Vermont Avenue**. The notorious **Alcatraz federal prison island** is located in San Francisco Bay, where **Al Capone** spent five years. It was closed in 1963.

## 5 Mins With ... William (Bill) Hollar



Bill and his wife at his daughter's college campus

- **Can you tell us about your educational background and career path so far?**

I earned my BS, MS and PhD in Chemical Engineering at University of Buffalo. I, then, moved on to spend 8 years with BP Chemicals focusing on process development of advanced ceramic materials and high temperature polymer processes. I have been with GE Plastics/SABIC for 19 years heavily involved in process development of engineering thermoplastics and intermediates. I enjoyed many roles in my career which have included plant process technologist and process engineer, Pilot Plant Leader, Global Technology Cost-out Leader. For the last 10 years I have focused on a technical career path as an individual contributor and project leader.

- **How can you describe you current role with SABIC and the main challenges you meet?**

Currently, I am a Chief Scientist with SABIC.

My role as part of the Technology & Innovation (T&I) organization is the development and scale-up of new processes and developing process improvements for plant implementation

In addition, I serve as a subject matter expert, I mentor fellow engineers/scientists in multiple functions and I also act as project leader for large technology programs.

- **In your opinion, what are the top three success factors that would ensure job satisfaction for a chemical engineer?**

Being strong technically is important, but often other skills that will determine your success and satisfaction

1. Find a job that allows you to work on subjects/projects/technical areas you are enthusiastic about. Remember this will change with time so take time to manage/build your career
2. Build relationships throughout your career and get a good mentor early in your career
3. Never stop learning – you live in an age where you have vast amounts of information/training at your fingertips – use it!

- **Tell us about AIChE and PDD and how it all started for you?**

I attended national AIChE meetings going back to 1985 on an irregular basis. I started regularly attending AIChE meetings around 2008. At that time a SABIC colleague (Ramesh Rameswaran) introduced me to the Process Development Division. I really benefited from the technical topics that the Division focused on and the broad span of areas all the way from Basic Process Research to Manufacturing and Commercialization. It was an ideal match of subject matter to the types of problems I had worked on throughout my career. I was so enthusiastic about the Division's mission that I became involved in chairing sessions and eventually became an area chair.

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- **What can you tell young engineers joining/wanting to join PDD?**

This is a great forum for learning about the intersection of chemical engineering science and practical application to the development and commercialization of new processes and technologies.

The Division works hard to remain relevant in the changing world of chemical engineering either through new areas within the division such as Process Intensification/Product Design and Development or co-sponsoring with many of the other Divisions within AIChE.

- **What has been the proudest technical moment in your career and why?**

Working on and watching the successful commercialization and growth of new polycarbonate co-polymers from the lab to the pilot plant scale-up and the transition to manufacturing that I personally worked on. It was an opportunity that challenged all my skills as an engineer and problem solver.

- **What has been one of the most exciting technical developments that you've seen shape or transform our industry (could be equipment...product...etc.)**

The marriage of exponential growth of information availability/computing power and its application to chemical engineering and process development (this is from a person who used punch cards to run FORTRAN programs as a university undergraduate). Going from programming equations of state in BASIC/Fortran to the power of today's process simulators and CFD packages is in retrospect mind boggling.

Having access to hundreds of journals and textbooks at the touch of keystroke on your PC is another example – I remember when staying current meant spending Friday afternoons in the library scanning hard copy journals for articles of interest.

- **If you were to choose a totally different career than being a chemical engineer, what would be your first preference?**

I would really enjoy having a degree and doing something related to psychology – I love trying to understand what drives people lives, behaviors and interactions.

- **How do you like to spend your vacations/holidays?**

I have 5 children so I spend a lot of my time off with my family. I also enjoy working on the house and gardening. I like to fish and really enjoy travelling. I have a very strong interest in philosophy and history – I particularly enjoy ancient Chinese philosophy.



Interested in expanding your network in the field of Process Development? Join our Linked-In group! Find us here:

<http://linkedin.com/groups?gid=4013623>





# PDD Fall 2013 Programming

<b>Sunday, November 3 Late PM (3:30 PM-6:00 PM)</b>	
23 Physical Properties for Chemical Product Design	
<b>Monday, November 4 Morning (8:30 AM-11:00 AM)</b>	
77 Process Development Division Plenary	37 Area Plenary: Industrial Sustainability (Group 23)
62 Memorial Session in Honor of Don Woods (Group 4)	
<b>Monday, November 4 Early (PM 12:30 PM-3:00 PM)</b>	
115 Challenges and Best Practices in Technology Commercialization	
117 Designing Biomedical Devices	
<b>Monday, November 4 Late PM (3:15 PM-5:45 PM)</b>	
185 Issues and Challenges in Teaching Chemical Process Design	182 Innovations of Energy-Efficient Manufacturing Processes and Building Technologies (Topical G)
<b>Monday, November 4 Evening (6:00 PM-8:00 PM)</b>	
219 Poster Session: Process Intensification and Microprocess Engineering (Area 12EF)	
220 Poster Session: Process Research and Innovation (Area 12A)	
<b>Tuesday, November 5 Morning (8:30 AM-11:00 AM)</b>	
241 Crystallization Process Development I	230 Advances in Predictive Scale Down Capabilities (Group 26)
267 Poster Session: Building a Career In The Chemical Industry	
269 Product and Molecular Design	
<b>Tuesday, November 5 Early PM (12:30 PM-3:00 PM)</b>	
298 Crystallization Process Development II	
308 Innovation in Action: From Invention to Marketable Products	
<b>Tuesday, November 5 Late PM (3:15 PM-5:45 PM)</b>	
341 Advances in Process Intensification	343 Application of Quality by Design in API Process Development (Group 26)
385 Single and Multistage Cross Flow Filtration Processes: Fundamentals and Applications (Group 2)	

## PDD Fall 2013 Programming Continued (1)

<b>Wednesday, November 6 Morning (8:30 AM-11:00 AM)</b>	
412 Bioprocessing and Biomass to Biofuels and Value-Added Bioproducts I	419 Designing Products and Molecules (Group 10)
445 Process Intensification by Process Integration	438 Novel Reactors (Group 20)
444 Process Design: Innovation for Sustainability (Group 23)	
<b>Wednesday, November 6 Early PM (12:30 PM-3:00 PM)</b>	
470 Bioprocessing and Biomass to Biofuels and Value-Added Bioproducts II	478 Conversion of Solid Wastes to Energy and/or Product (Topical G)
507 Process Design for Process Intensification	
<b>Wednesday, November 6 Late PM (3:15 PM-5:45 PM)</b>	
565 Process Intensification By Enhanced Mass and Heat Transfer	534 Conversion of Solid Wastes to Energy and/Or Product II (Topical G)
566 Product and Process Development for Sustainability	
<b>Thursday, November 7 Morning (8:30 AM-11:00 AM)</b>	
596 Case Studies in Process Intensification and Microprocess Engineering	638 Pharmaceutical Process Development & Pilot Plants (Group 26)

# 2014 Spring Meeting and 10th Global Congress on Process Safety

## March 30 - April 3, 2014

### Hilton New Orleans – Riverside

The AIChE Spring Meeting is the year's key technical conference for practicing chemical engineers. A wide range of subjects relevant to the current needs of industry is covered. Plus, the Global Congress on Process Safety covers the critical needs of process safety practitioners more broadly and deeply than any other conference.

Topical Conferences at this year's meeting include:

- 2nd International Conference on Upstream Engineering and Flow Assurance
- Shale Gas and Light/Tight Oil
- 14th Gas Utilization Topical Conference
- 17th Topical Conference on Refinery Processing
- 26th Ethylene Producers' Conference
- Manufacturing in the 21st Century
- Emerging Technologies in Clean Energy for the 21st Century
- Distillation Symposium

And the [10th Global Congress on Process Safety](#) featuring the:

- 29th CCPS International Conference
- 48th Loss Prevention Symposium
- 16th Process Plant Symposium

***Submit an Abstract ...***

***Call for Papers is now OPEN!!***

# 2014 Spring Meeting and 10th Global Congress on Process Safety

## PDD Spring 2014 Tentative Programming

### **Area A**

#### Develop of Shale Gas and Tight Oil Technologies

- Chair: Joe Powell

#### Disruptive Innovation (YPC)

- Chair: Pankaj Gautam, Co-chair: Jon Worstell and Joe Powell

#### Process Research and Development for Industrial Sustainability

- Chair Qiang Xu

#### Six Sigma Process Development

- Chair Bill Hollar, Co-Chairs: Tom Enright/ George Lieberman

#### Technology Development at Research Institutes

- Chair Santiago Faucher

### **Area B**

#### Best Practices in Pilot Plants

- Chair: Oliver Orrell, Co-chair: Kiran Gupte

#### Pilot Plant Process Safety & Management of Change

- Chair: Joe Powell

#### Big Data in Process Development

- Chair: Lance Baird

#### Challenges in Process Scale-up

- Chair: David Attride, Co-Chair: Pankaj Gautam

### **Area C/D**

#### Smart manufacturing

- Chair: William Hollar

#### Steam traps/water quality (energy conservation – online analyzer))

- Chair: Jon Worstell, Co-chair: William Hollar

#### Online analyzers for smart manufacturing

- Co-chair: Kiran Gupte

#### Best Senior design competition

- Chair: Jon Worstell, Co-chair: Ken Cox

### **Area E/F**

#### Advances in Process Intensification

- Chair: Steven Vallee

#### Process Intensification by process Integration

- Chair: Pankaj Gautam

#### Reactive/intensified Distillation

- Chair : Aspi Kollah, Co-chair: Tom Kenat

#### Safer Processes through PI

#### Intensified Processes Case Studies

- Chair: Hani Gadallah

#### Scale-up of Intensified Processes

- Chair: Steven Vallee

### **Area G**

#### Product Design for Oilfield Applications

#### Optimizing Inhibitors and Additives Based on Physical Properties

#### Product Design for Renewable Energy and Sustainability

#### Chemical Engineering Contributions to the Design of Transducers and Probes

## Process Development Area Leadership

	Chair	Chair Elect	Area Coordinator
<b>12a</b> Process Research & Innovation  <a href="http://pd-aiche.com/area12a">pd-aiche.com/area12a</a>	Santiago Faucher Hatch 905-403-4001 <a href="mailto:Sfaucher@hatch.ca">Sfaucher@hatch.ca</a>	Qiang Xu ChE Dept Lamar University 409-880-7818 <a href="mailto:qiang.xu@lamar.edu">qiang.xu@lamar.edu</a>	Tom Enright Xerox Research 905-823-7091 x345 <a href="mailto:tom.enright@xerox.com">tom.enright@xerox.com</a>
<b>12b</b> Pilot Plants  <a href="http://pd-aiche.com/area12b">pd-aiche.com/area12b</a>	David Attridge Eastman Chemicals 423-967-8840 <a href="mailto:dattride@eastman.com">dattride@eastman.com</a>	Kiran Gupte BP 630- 420-4390 <a href="mailto:kiran.gupte@bp.com">kiran.gupte@bp.com</a>	Oliver Orrell Zeton Inc. 905-632-3123 x264 <a href="mailto:oorrell@zeton.com">oorrell@zeton.com</a>
<b>12c/d</b> Technology Transfer & Manufacturing  <a href="http://pd-aiche.com/area12c">pd-aiche.com/area12c</a>	Willian Hollar SABIC Technical Center – Engineering Thermoplastics 812-831-4751 <a href="mailto:William.hollar@sabic-ip.com">William.hollar@sabic-ip.com</a>	Jon Worstell <a href="mailto:jonathanworstell@aol.com">jonathanworstell@aol.com</a>	David Reeder Cargill Process Solutions Technology Development Center 952-984-5862 <a href="mailto:david_reeder@cargill.com">david_reeder@cargill.com</a>
<b>12e/f</b> Process Intensification  <a href="http://pd-aiche.com/area12e">pd-aiche.com/area12e</a>	Zhijun Jia Chart Energy & Chemicals, Inc. 608- 787-6714 <a href="mailto:zhijun.jia@chart-ind.com">zhijun.jia@chart-ind.com</a>	Open	Derek Griffin Lanza Tech 630-439-3054 <a href="mailto:Derek@lanzatech.com">Derek@lanzatech.com</a>
<b>12g</b> Product Design  <a href="http://pd-aiche.com/area12g">pd-aiche.com/area12g</a>	Ken Cox Rice University 713- 348-3529 <a href="mailto:krcox@rice.edu">krcox@rice.edu</a>	Open	Mosha Zhao ExxonMobil Chemical Company 281-834-2626



## Process Development Division Leadership (2012-2014)

Chair	Michael Hill Columbia University 212-854-1095 Email: mhill@columbia.edu	Chair Elect	John F. Peragine Bristol-Myers Squibb Phone: (732) 227-5688 E-Mail: John.Peragine@bms.com
Program Chair	Robert S. Huss, Ph.D. Eastman Chemical Company Phone: 423-229-6425 Email: rhuss@eastman.com	Membership Chair	Kevin Joback Molecular Knowledge Systems, Inc. Phone: 603-472-5315 kevin@molknow.com
Assistant Program Chair	Santiago Faucher Hatch 905-403-4001 Sfaucher@hatch.ca	CTOC Liaison	Cawas A. Cooper AIChE Fellow Phone/Fax: (610) 509-7660 E-Mail: cawas.cooper@gmail.com
Treasurer	David Edwards Zeton Inc. Phone: (905) 632-3123 Email: dedwards@zeton.com	Awards Chair	Jay Miller LyondellBasell Industries Phone: (610) 359-2092 Email: j.miller@lyondellbasell.com
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