# The PTF Newsletter

## 2012 ANNUAL PTF MEETING AT THE AIChE ANNUAL MEETING IN PITTSBURGH

This year the AIChE Annual Meeting is in Pittsburgh at the David L. Lawrence Convention Center from October 28th through November 2nd, 2012. Of course, the PTF Annual Meeting is part of that. What is exciting about this year's PTF Meeting is that there are more co-sponsored sessions this year than any other year in recent memory. As a result, we think our sessions are not only targeted to relevant research but with multidiscipline flavor.

The PTF meeting starts on Saturday with the PTF sponsoring three Student Career Workshops for future young professionals. Our goal is to educate the student population on the science of particle technology, and how the PTF can be a resource for that science. On Sunday, the PTF is sponsoring an all-day workshop on multiphase fluid dynamics taught by Prof. Dimitri Gidaspow of IIT and Dr. Reza Mostofi of UOP, with support from several CFD vendors.

The technical sessions start on Monday morning with Group 3A, Particle Production and Characterization, starting in full force. This year, Group 3A has a nice mix of particle technology with the nanoparticle and the pharmaceutical disciplines. There are also a couple of sessions on modeling which includes population balance modeling.

Group 3B, Fluidization and Fluid-Particle Systems, is also starting in full swing with three sessions honoring Dr. Tom O'Brien of NETL and Prof. John Chen of Lehigh University. Tuesday is fluidization fundamentals day with three sessions on the topic. There are two sessions on industrial applications of CFD, and another two sessions on environmental issues.

The sessions for Group C, Solids Flow Handling and Processing, has a few sessions on Monday. It gets more exciting on Tuesday with five sessions, including three dynamic modeling sessions. Group C finishes the week on Thursday with sessions on gas solids transport, mixing, segregation and drying.

Group D, Nanoparticles, also starts with three sessions on Monday, all on functional nanoparticles and nanocoatings. There are sessions on nanostructures and gas phase synthesis on Tuesday and Wednesday. On Thursday there are five sessions on nanoenergetics and nanoelectronics.

Group E, Energetics, is sponsoring the same nanoelectronics sessions on Thursday with Group D. On Wednesday, Group E has a session on thermophysical properties and safety.


Don't forget that Tuesday night at 6:00 PM is the PTF Poster Session which typically has a good number of student contributions. These papers are usually very good, and I know they would be excited to discuss their research with you. The PTF Award Session is on Wednesday at 3:15 PM. Our speakers are Prof. James Litster of Purdue Unversity and this year's recipient of the Shell Global Solutions Thomas Baron Award and Prof. Xiaotao Bi of University of British Columbia and recipient of this year's PSRI Lectureship Award.

Afterwords, head over to the PTF Dinner at the Sonoma Grille where a reception with drinks. sponsored by Jenike and Johanson, start, at 6:00 PM, and dinner starts at 7:30 PM with CPFD-Software providing some very nice wine. The award ceremony is after dinner. If you have not bought your PTF Dinner Tickets yet, you can get them at meeting's registration desk before Tuesday.

It should be a good week for powder technology. There are plenty of good and relevant talks with some good entertainment as well. We do have one word of caution. Wear comfortable shoes and bring an umbrella. The Particle Technology Forum (PTF) is spread out between the convention center, Westin Hotel and Omni Hotel. The Omni Hotel is a 10 minute walk from the convention center. Groups 3B, 3C, and 3E are mostly confined to the Omni Hotel in Conference Rooms A, B or C. Groups 3A and 3D are split with some sessions in the Omni Hotel and others in the Westin Hotel. We recommend starting a training program now.

*Ray Cocco, PTF Chair*

## Group 3A: Particle Production and Characterization

Dr. Pavol Rajnaiak (Chair) & Prof. Rajesh Dave (Co-chair)

| Session ID | Session Title | Day | Time | Room |
|---|---|---|---|---|
| 03A03 | Population Balance Modeling for Particle Formation Processes: Nucleation, Aggregation and Breakage Kernels | Mon, Oct 29 | 8:30 AM | Conference B (Omni) |
| 03C06 | Characterization and Measurement in Powder Processing | Mon, Oct 29 | 8:30 AM | Oakmont (Omni) |
| 03A06 | Characterization of Engineered Particles and Nanostructured Particulate Systems | Mon, Oct 29 | 12:30 PM | Conference B (Omni) |
| 03A04 | Agglomeration and Granulation Processes | Mon, Oct 29 | 3:15 PM | Conference B (Omni) |
| 03D01 | Gas Phase Synthesis of Nanoparticles | Tue, Oct 30 | 12:30 PM | Conference A (Omni) |
| 02B01 | Particle Formation and Crystallization Processes from Liquids, Slurries adn Emulsions | Tue, Oct 30 | 3:15 PM | Crawford West (Westin) |
| 03A07 | Dynamics and Modeling of Particles, Crystals adn Agglomerate Formation | Tue, Oct 30 | 3:15 PM | Conference A (Omni) |
| 03A05 | Applications of Engineered Structured Particulates | Wed, Oct 31 | 8:30 AM | Conference A (Omni) |
| 15B09 | Applications of Continuous Processing and Manufacture of Pharmaceuticals | Wed, Oct 31 | 8:30 AM | Allegheny III (Westin) |
| 15B04 | Particle Engineering as Applied to Pharmaceutical Formulations I | Wed, Oct 31 | 3:15 PM | Allegheny III (Westin) |
| 03A08 | Particle Breakage adn Comminution Processes | Thu, Nov 1 | 8:30 AM | Conference C (Omni) |
| 03A01 | Engineered Composite Particulate Systems for Pharmaceutical Active Ingredient Delivery | Thu, Nov 1 | 8:30 AM | Oakmont (Omni) |
| 03A09 | Magnetic Particle Synthesis and Properties | Thu, Nov 1 | 12:30 PM | Conference C (Omni) |
| 03A02 | Engineered Composite Particulate Systems for Pharmaceutical Active Ingredient Delivery II | Thu, Nov 1 | 12:30 PM | Oakmont (Omni) |

## Group 3B: Fluidization and Fluid-Particle Systems

Prof. Ah-Hyung Park (Chair) & Dr. S.B. Reddy Karri (Co-chair)

| Session ID | Session Title | Date | Time | Room |
|---|---|---|---|---|
| 03B01 | Special Session to Celebrate Tom O'Brien's Career Long Accomplishments I | Mon, Oct 29 | 8:30 AM | Conference C (Omni) |
| 03B10 | Special Session to Celebrate Tom O'Brien's Career Long Accomplishments II | Mon, Oct 29 | 12:30 AM | Conference C (Omni) |
| 03B11 | Special Session to Celebrate John Chen's Career Long Accomplishments | Mon, Oct 29 | 3:15 PM | Conference C (Omni) |
| 03B02 | Fundamentals of Fluidization | Tue, Oct 30 | 8:30 AM | Conference C (Omni) |
| 03B05 | Fundamentals of Fluidization II | Tue, Oct 30 | 12:30 PM | Conference C (Omni) |
| 03B03 | Fundamentals of Fluidization III | Tue, Oct 30 | 3:15 PM | Conference C (Omni) |
| 03B06 | Industrial Application of Computational and Numerical Approaches to Particle Flow I | Wed, Oct 31 | 8:30 AM | Conference C (Omni) |
| 03B00 | Industrial Application of Computational and Numerical Approaches to Particle Flow II | Wed, Oct 31 | 12:30 AM | Conference C (Omni) |
| 03B04 | Fluidization and Fluid-Particle Systems for Energy and Environmental Applications I | Thu, Nov 1 | 8:30 AM | Conference B (Omni) |
| 03B07 | Fluidization and Fluid-Particle Systems for Energy and Environmental Applications II | Thu, Nov 1 | 12:30 PM | Conference B (Omni) |
| 03B08 | Circulating Fluidized Beds | Thu, Nov 1 | 3:15 PM | Conference B (Omni) |

## Group 3C: Solids Flow Handling and Processing

Prof. Kimberly Henthorn (Chair) & Dr. Ben Freireich (Co-chair)

| Session ID | Session Title | Date | Time | Room |
|---|---|---|---|---|
| 03C06 | Characterization and Measurement in Powder Processing | Mon, Oct 29 | 8:30 AM | Oakmont (Omni) |
| 03D05 | Functional Nanoparticles and Nanocoatings on Particles II | Mon, Oct 29 | 12:30 PM | Conference A (Omni) |
| 02B03 | Alternative Crystallization Technologies and Case Studies of Crystallization Processes | Tue, Oct 30 | 8:30 AM | Crawford West (Westin) |
| 03C04 | Dynamics and Modeling of Particulate Systems I | Tue, Oct 30 | 8:30 AM | Conference B (Omni) |
| 03C05 | Dynamics and Modeling of Particulate Systems II | Tue, Oct 30 | 12:30 PM | Conference B (Omni) |
| 03C03 | Dynamics and Modeling of Particulate Systems III | Tue, Oct 30 | 3:15 PM | Conference B (Omni) |
| 03C01 | Solids Handling and Processing | Wed, Oct 31 | 12:30 PM | Conference B (Omni) |
| 03C10 | Gas-Solid Transport and Separations | Thu, Nov 1 | 8:30 AM | Conference A (Omni) |
| 03C02 | Mixing and Segregation of Particles | Thu, Nov 1 | 12:30 PM | Conference A (Omni) |
| 03C07 | Drying | Thu, Nov 1 | 3:15 PM | Conference A (Omni) |

### Group 3D: Nanoparticles

Dr. Karsten Wegner (Chair) & Dr. Bjoern Schimmoeller (Co-chair)

| Session ID | Session Title | Date | Time | Room |
|---|---|---|---|---|
| 03D02 | Functional Nanoparticles and Nanocoatings on Particles I | Mon, Oct 29 | 8:30 AM | Conference A (Omni) |
| 03D05 | Functional Nanoparticles and Nanocoatings on Particles II | Mon, Oct 29 | 12:30 PM | Conference A (Omni) |
| 03D03 | Functional Nanoparticles and Nanocoatings on Particles III | Mon, Oct 29 | 3:15 PM | Conference A (Omni) |
| 03D04 | Nanostructured Particles for Catalysis | Tue, Oct 30 | 8:30 AM | Conference A (Omni) |
| 03D01 | Gas Phase Synthesis of Nanoparticles | Tue, Oct 30 | 12:30 PM | Conference A (Omni) |
| 17002 | Chemical Conversion of Woody Biomass | Wed, Oct 31 | 12:30 PM | 304 (Convention Center) |
| 08E03 | Nanoelectronic Materials and Devices I | Thu, Nov 1 | 8:30 AM | Westmoreland East (Westin) |
| 03E01 | Nanoenergetic Materials I | Thu, Nov 1 | 8:30 AM | Frick (Omni) |
| 08E00 | Nanoelectronic Materials and Devices II | Thu, Nov 1 | 12:30 PM | Westmoreland East (Westin) |
| 03E04 | Nanoenergetic Materials II | Thu, Nov 1 | 12:30 PM | Frick (Omni) |
| 03E00 | Nanoenergetic Materials III | Thu, Nov 1 | 3:15 PM | Frick (Omni) |

### Group 3E: Energetics

Prof. Jan Paszynski (Chair) & Dr. Paul Redner (Co-chair)

| Session ID | Session Title | Date | Time | Room |
|---|---|---|---|---|
| 03E03 | Thermophysical Properties of Energetic Materials | Wed, Oct 31 | 8:30 AM | Conference A (Omni) |
| 03E02 | Processing and Safety of Energetic Materials | Wed, Oct 31 | 12:30 PM | Conference A (Omni) |
| 03E01 | Nanoenergetic Materials I | Thu, Nov 1 | 8:30 AM | Frick (Omni) |
| 03E04 | Nanoenergetic Materials II | Thu, Nov 1 | 12:30 PM | Frick (Omni) |
| 03E00 | Nanoenergetic Materials III | Thu, Nov 1 | 3:15 PM | Frick (Omni) |

### Group 3 Special Sessions

| Session ID | Session Title | Date | Time | Room |
|---|---|---|---|---|
| 03000 | Particle Technology Forum Awards Lecture | Wed, Oct 31 | 3:15 PM | Conference A (Omni) |
| 03001 | Particle Technology Forum Poster Session | Tue, Oct 30 | 6:00 PM | Hall B (Convention Center) |

### PTF Planning Meeting (All Welcome to Attend)

| Session Title | Date | Time | Room | Session Title | Date | Time | Room |
|---|---|---|---|---|---|---|---|
| PTF General Meeting | Mon, Oct 29 | 6:00 PM | Conference B (Omni) | PTF Group C | Tues, Oct 30 | 11:05 AM | Conference C (Omni) |
| PTF Group A Meeting | Tue, Oct 30 | 11:05 AM | Conference A (Omni) | PTF Group D | Wed, Oct 31 | 11:05 AM | Conference C (Omni) |
| PTF Group B Meeting | Wed, Oct 31 | 11:05 AM | Conference B (Omni) | PTF Group E | Wed, Oct 31 | 11:05 AM | Conference A (Omni) |

### Post-Doctoral Positions Available!

**Department of Chemical and Biological Engineering**

**University of Colorado at Boulder**

**Contact Prof. Christine Hrenya (hrenya@coloardo.edu)**

Several post-doctoral positions are available with Professor Christine Hrenya in the Department of Chemical and Biological Engineering at the University of Colorado, Boulder. Projects include "Using Granular Material for Heat Transfer in Solar Power Systems" and Fluidization and Entrainment of Cohesive Particles." Applicants are encouraged to apply by October 28 2012. The University of Colorado at Boulder is committed to diversity and equality in education and employment.

### Computational Fluidization Workshop

**Sunday, October 28 (Before AIChE Annual Meeting)**

**Prof. Dimitri Gidaspow (IIT) & Dr. Reza Mostofi (UOP)**

A full day workshop on computational fluidization will be taught on Sunday, October 28 at the Annual AIChE Meeting (Location to be Announced). Course will cover the governing equations and kinetic theory of granular fluids for multiphase flow followed by several hands-on demonstrations including bubbling fluidized bed, CFD riser for FCC operations, and $CO_2$ capture using fluidized bed sorbents. Afterwards, several CFD vendors will discuss their product. All those interested should contact Anne Schaeffer at the ACIhE at annes@aiche.org.

KNOW FLOW'S KORNER

## EXPAND YOUR TECHNOLOGY HORIZONS: USING PATENT LITERATURE AS A SIGNIFICANT SOURCE OF KNOWLEDGE

As technology expands at an ever-increasing pace, access to and the utilization of existing knowledge to seek out innovative solutions becomes critical to the success of current and future technical professionals. Most companies, from large, multi-national corporations to start-up ventures are seeking a sustainable competitive advantage through intellectual property, including patents.

Despite an increasing recognition that intellectual property can create and/or sustain value, a surprising number of students, including doctoral graduates, and even many technical professionals, have never read a patent, and know little about the patenting process. In academia, there is often a tendency to rely on published literature (such as journal articles and conference proceedings). However, a high proportion of leading-edge technology is well-documented in patent filings. Companies, governments & institutions invest billions of dollars in research so the most creative minds and leading technology innovators can generate solutions which can be protected by the appropriate use of Intellectual Property. In general, the companies which are the most prolific in filing patents are recognized as the leaders in their respective fields.

For a concise and informative summary of Intellectual Property, including a brief description of patent basics, please refer to a CEP article by M.H. Heines [1].

Most technical people are familiar with "The Scientific Method", which is interpreted and illustrated in various forms. It can be represented as having the following steps: 1) define the problem; 2) review the literature; 3) define the hypothesis(es); 4) design the experiment(s); 5) conduct the experiment(s); 6) analyze the data; 7) generate a solution(s); 8) implement the solution(s); 9) document the results. When identifying and planning a program for fundamental research, or a project for technology development, some consideration should be given to the prospect for generating Intellectual Property, and part of that should be exploiting the learning potential of relevant patent literature.

It is of interest to note that the American patent system, the first of its kind in the world, was authorized around 1790 by Article One, Section 8(8) of the U.S. Constitution which states:



Have an idea or suggestion for an article in the PTF Newsletter, please let us know. Contact Christine.Hrenya@Colorado.edu

*The Congress shall have power...To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries;*

The expressed purpose of this system, and the proven outcome, is to encourage individuals & companies to document the latest technology, thus enabling others to read about these developments, and utilize this background information as inspiration to create even greater advances. The corollary of this is that one who has an interest in a given field, and/or who believes they have a creative idea, must familiarize themselves with the relevant documentation in that field in order to understand the state-of-the-art, and to expand the boundaries with new concepts and discoveries.

When one has completed Step 1 and defined a "problem" or, perhaps, is seeking an opportunity to create a new solution, one should engage in Step 2 review the literature. In the spirit of the well-known axiom, *"An hour spent in the library is worth a month in the laboratory"* (Source Unknown), investigating the published art, including that contained in patent documents, can help formulate a more robust experimental plan which will increase chances of success and, potentially, generate new Intellectual Property.

As a project progresses from Step 3 through Step 7, the participant(s) should continue to re-evaluate whether there is potential for Intellectual Property based on the results and conclusions. When the project reaches Step 8 and Step 9, a key decision(s) needs to be made. If the project yields a solution(s) which may be patentable, a formal patent application should be filed before the invention is revealed to anyone not bound by some form of confidentiality obligation. Public disclosure of information impacts potential patentability. In the academic world of "publish or perish", there is an important role for patenting since it is a complementary form of documenting the results, which has the potential to generate significant value in the future.

Many people find the prospect of reading a patent to be somewhat intimidating, and they may become a bit confused by the lay-out, and some of the terminology being used; however, once one becomes familiar with patent documents, they can contain a wealth of useful information. First of all, patents are organized in a fairly consistent manner, though there may be some differences from country to country. There are many references, especially web-sites that provide a glossary of patent-related terms [2].

Reading a patent becomes easier when one knows what to expect & where to focus in looking for certain information. The basic elements of a patent document are as follows:

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- **Bibliography**-First page reveals key information such as the patent office (USPTO, EPO, WIPO, …), patent/publication number and date, application data such as number, priority date(s), filing dates, a list of inventors, the assignee (owner), as well as the title and an abstract, along with a few other details (coding, …)
- **Field of Invention**-Required; Describes the related field of invention
- **Background of Invention**-Not required, but commonly present; should describe a Problem and a Solution (a European requirement)
- **Summary of Invention**-Required; Describes different embodiments of the invention consistent with the claims
- **Description of Drawings**-Required if Drawings are present; as in many situations, a well-crafted drawing significantly enhances the understanding of a written description
- **Detailed Description of Invention**-Required; describes the invention and possible alternatives, e.g. components and ranges; Must be "enabling" **; Must disclose the best mode (often, there is more than one example; the "best mode" does not have to explicitly identified)
- **Examples**-Provide specific description of the invention; typically required for chemical patents to show patentability; Inventive Examples v. Comparative Examples; Actual Examples v. Constructive Examples (described but not actually executed)
- **Test Methods**-Required if a property is a required component of a claim; Must be enabling **
- **Tables**-Not required, but very helpful; should designate examples properly (inventive vs. comparative); Should provide proper test methods; Should provide proper units
- **Claims**-Required; must have proper and consistent support in the "specification", which includes the description, examples, test methods, etc. The claims, if/when granted, form the legal boundaries of the technology.

***The terms "enabling", "enable" & "enablement" often are used in relation to patent matters. They are legally significant because the description of an invention, along with the examples & test methods used, must provide sufficient detail that "one skilled in the art" should be able to reproduce the results to determine whether they may infringe on the claims of the patent.*

One important distinction which must be understood is that, in the patent literature, there are granted patents & published patent applications ("publications"). They represent two different stages in the lifetime of a patent case. To minimize confusion associated with discussing the various options for filing a patent case, the schematic (below) illustrates **one** well-defined time-line common for many patent cases. Since examination & prosecution of patent cases is done in the "national" patent offices, the timing of this process, and the length of time for a patent to grant, in an individual patent office, varies widely. The important point, for the purposes of this paper, is that, by international agreement, virtually all patent applications are publicly disclosed about 18 months after their initial filing.


In terms of the value as a literature reference, there's little difference between a published application and a granted patent; however, a granted patent allows the assignee to enforce the right to exclude others from practicing technology within the scope of the granted claims, in the country in which they are granted. It is not within the scope of this paper to discuss the implications of having enforceable patent rights. **A large percentage of patent applications are never granted, for various reasons; however, they still are of value as reference material.**

There are various means to access patent literature ranging from the web-sites of individual patent offices [3-5], free search engines on the Internet [6], as well as subscriber services [7,8]. Most of these sites have some form of on-line help features which allow someone to familiarize themselves with terminology & the search features/tools.

Two of the largest collections of patent references are:

- **Derwent World Patents Index® (DWPI℠)**, produced by Thomson Reuters Scientific, provides access to information from more than 42.5 million patent documents, giving details of over 20 million inventions.
- **INPADOC**, which stands for International Patent Documentation Center, is an international patent collection. The database is produced and maintained by the European Patent Office (EPO). It contains patent families and legal status information, and is updated weekly.

As technical professionals, it is important to recognize the increased collaboration between industry and academia, the increased need for companies to find sustainable competitive advantage in a global marketplace, as well as the need for start-up companies to attract venture capital. Intellectual

property is an important element of each of these scenarios. To enhance your personal skill set and, potentially, enhance the quality and value of your work, you are encouraged to expand your range of literature searching to include relevant patent literature. Much of the latest and greatest technology, from most of the greatest innovators, resides in these documents.

Additional Resources

[1] Heines, M. H., "Back to Basics: A ChE's Guide to Intellectual Property", CEP May 2012 (www.aiche.org/cep)
[2] http://ipso.usu.edu/htm/inventors/glossary/ : glossary of common patent terms
[3] www.uspto.gov : (free) database of patents / publications in the US Patent & Trademark Office (USPTO)
[4] www.wipo.int : (free) database of published patent applications in the World Intellectual Property Organization (WIPO), sometimes referred to as "PCT", which actually stands for Patent Cooperation Treaty
[5] www.epo.org : (free) database of patents / publications in the European Patent Office (EPO)
[6] www.google.com/advanced_patent_search : (free) access to the database in the USPTO
[7] www.thomsoninnovation.com : (subscriber) sophisticated search engine with access to worldwide patent sources. Utilizes Derwent and INPADOC patent collections.
[8] https://scifinder.cas.org : (subscriber) access to the world's largest and most reliable collection of chemistry and related science information, including patent references

Profile:

Darrel E. Docking earned a Bachelor of Applied Science in Chemistry in 1978 from the University of Waterloo in Canada. He started his career with The Dow Chemical Company in Canada and has worked in four different locations in the US & Canada. His experience spans the fields of polyurethanes, styrenic block copolymers, and polyolefins, holding several technical and leadership positions in R&D, Technical Service, and Marketing. For the past 18 years, he has worked in Intellectual Capital Management in Freeport, Texas and, currently, has the title of Sr. Intellectual Capital Leader for Performance Plastics.

**All past PTF newsletters are now archived at the PTF site on the Newsletter section under the menu heading "Activities". The direct link to the Newsletter section is** http://aicheptf.org/activities/newsletter**. As always, please email any comments, suggestions, or concerns regarding the web site to Pat Spicer at** spicer.pt@pg.com

## PTF Dinner - October 31, 2012

*The Sonoma Grille*
947 Penn Ave
Pittsburgh, PA
Across from Convention Center

Reception at 6:00 PM
Dinner at 7:30 PM

$75 per Person
Sign Up With Your Meeting Registration or When You Pick Up Your Registration Materials

***Interested in helping the PTF as a sponsor?*** We have opportunities for sponsoring awards and dinners. Sponsorship brings recognition in our newsletter and website. Please contact Ray Cocco at ray.cocco@psrichicago.com

**University of Pittsburgh Alumni**
Sponsor of the 2012 George Klinzing Best PhD Award

**DuPont**
Sponsor of the 2012 PTF Award

**Dow**
Sponsor of the 2012 Fluidization Processing Award

**Shell Global Solutions**
Sponsor of the 2012 Thomas Baron Award

**PSRI**
Sponsor of the 2012 Lectureship in Fluidization Award

# 2012 PTF AWARD RECIPIENTS

**George Klinzing Best PhD Award (Sponsored by Pittsburgh Alumni)**

**Dr. Mayank Kashyap**

Process Technology Fluidization Engineer

Ascend Performance Materials, LLC

For his dissertation work entitled "Measurement and Computation of Dispersion and Mass Transfer Coefficients in Fluidized Beds" under the advisory of Prof. Dimitri Gidaspow at Illinois Institute of Technology.

**Particulate Solid Research, Inc. Lectureship Award**

**Prof. Xiaotao (Tony) Bi**

Professor and Director of UBC Clean Energy Research Centre

The University of British Columbia

For his outstanding contributions in delineating fluidization flow regimes, understanding electrostatics, investigating turbulent fluidization, defining choking, clarifying flooding and assisting with signal interpretation.

**Shell Global Solutions Thomas Baron Award**

**Prof. James D. Litster**

Professor of Chemical Engineering & Professor of Industrial & Physical Pharmacy

Purdue University

For his seminal and field-defining contributions in the area of particle design and formulation, with particular emphasis on the science and engineering of wet granulation systems.

**DuPont PTF Award for Lifetime Achievements**

**Prof. John R. Grace**

Professor and Canada Research Chair

The University of British Columbia

For his outstanding contributions in research and education in chemical engineering and for being one of the leading researchers in fluidization and multiphase systems.

**PTF Service Award**

**Ralph Nelson**

For his dedication to the PTF and his emphasis in providing continuing education in particle technology

LETTER FROM THE CHAIR

## OUR DEMOGRAPHICS

One of the objectives of the PTF is to be a focal point for all those involved in particle technology. In other words, the PTF serves as a bridge between academia and industry, young professionals and tenured practitioners. In reality, we may be falling short of that objective. Recent data suggest we are limiting our market share and what market share we have may not be addressed adequately.

As shown in Figure 1, most of our PTF members have 10 years of experience or more. Less than 25 percent of our membership are young professionals. Almost 90 percent of our membership is older than 35 years of age as shown in Figure 2.

At first, I thought that maybe the PTF is weighted with individuals with advanced degrees. If so, Figure 2 would not be so surprising. However, more than ⅔ of the PTF are professionals with Bachelor of Science degrees, as shown in Figure 3. These are the individuals entering the work place at 22 to 23 years of age. Of that work force, only 6 percent of them are involved with the PTF as members. Personally, I find our market penetration in this sector to be unsatisfactory.

This is not about getting more PTF members and getting them early. Although it is surely one of our goals, as with most organizations, it is not our primary goal. Our primary goal is to be a conduit for our members with contacts, technology and fellowship. The soooner one gets access to the PTF in their career, the more successful they will likely be. The statistics in Figures 1 through 3 suggest that we are not getting the message out to the young professionals.

The next surprise was our demographics between academic and non-academic (i.e., everyone else) professionals. According to the data shown in Figure 4, the non-academic professional (presumably consisting mostly of those from industry or working with industry) outnumber the

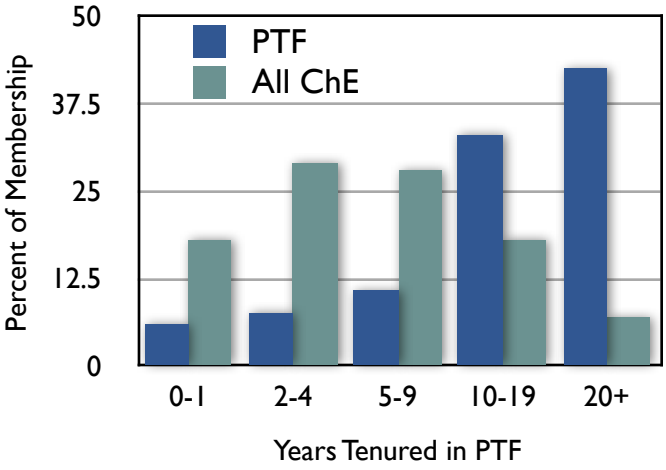


*Figure 1: Years tenured for PTF. ChE data from NSF's SESTAT, 1999.*

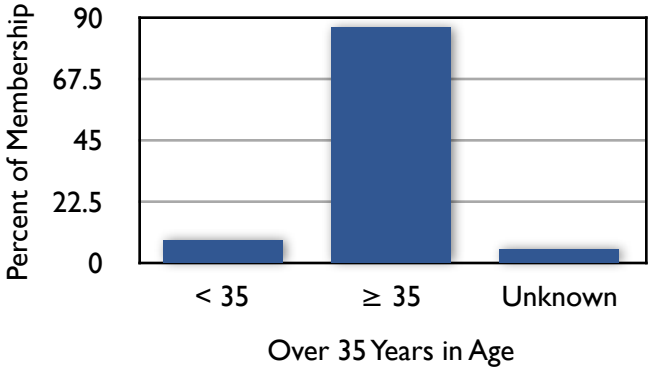


*Figure 2: Age demographics for PTF.*

academics by 2 to 1. That is not what I saw from our attendance at our last few annual meetings. We would be lucky if it were opposite of that. So, why is industry not participating at our annual meeting to the extent we see with our academia? There are the obvious reasons; intellectual property, travel expenses, time, and our meetings are not engaging our Bachelor level professionals. Thus, the question really should be how can we make it easier to have industrial involvement in our national meetings? Can our newsletters and web pages be better directed to industry without compromising our communication with academia?

Finally, the last statistic is the most disturbing. Figure 5 shows the breakdown in demographics between male and female members. Less than 9 percent of our membership is composed of female professionals. Yet, according to the National Science Foundation's Scientist and Engineering Statistical Data System (SESTAT), more than 16% of the chemical engineering work force are females, which is twice of what we have

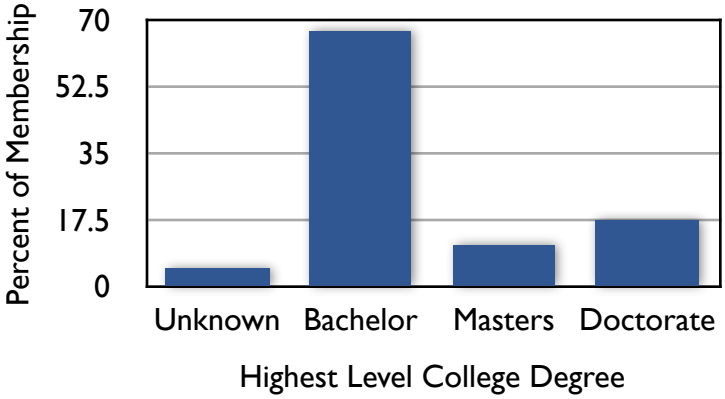


*Figure 3: Educational level for PTF.*

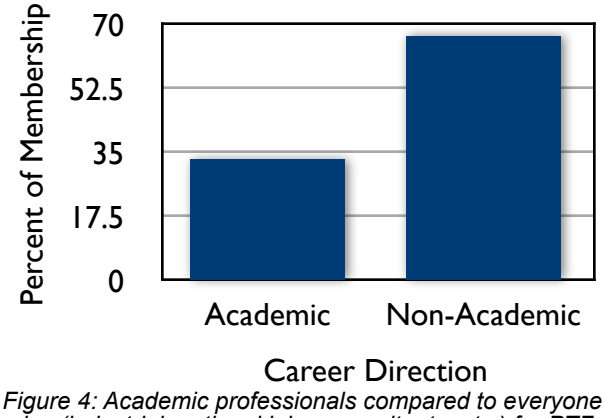


*Figure 4: Academic professionals compared to everyone else (industrial, national labs, consultants, etc.) for PTF.*

in the PTF. Now, one reason for these numbers is that the PTF is weighted towards more senior professionals where fewer women were in the workplace coming out of school, as shown in Figure 6. This just highlights that we need to attract more young professionals AND women chemical engineers.

Similarly, I suspect we may have an issue with not having enough minority exposure as well. Regrettably, I have no statistics here. However, we would be limiting ourselves if we did not add minority exposure as another limitation with the PTF.

These statistics suggest that the PTF needs to focus on our young professionals, industrial members, and our women engineers. How are we going to this? Remember, our executive committee meets once a year and for 2 to 3 hours. It takes us an hour just to find the room and the projector. Thus, my recommendations below are not just for the PTF EC, but for all of us.

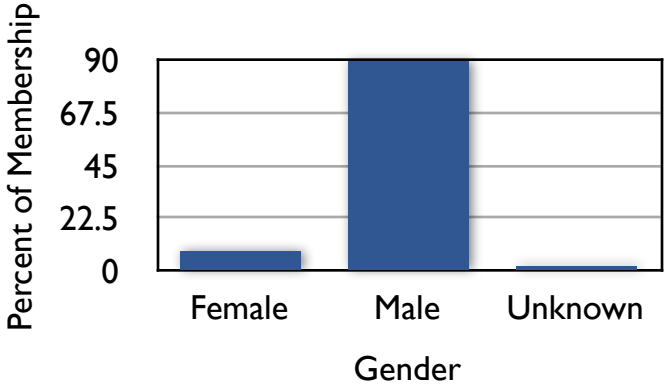


*Figure 5: Male and female professionals in the PTF.*

Workshop at the student meeting, and it is well attended, but we need to have more exposure with our students. The AIChE does have an ambassador program for professionals to interact with chemical engineering students. I urge we take better advantage of this program.

**Attracting Young Professionals to the PTF**

First, we need to have more exposure with our young professionals. The PTF does have participation in the AIChE Career

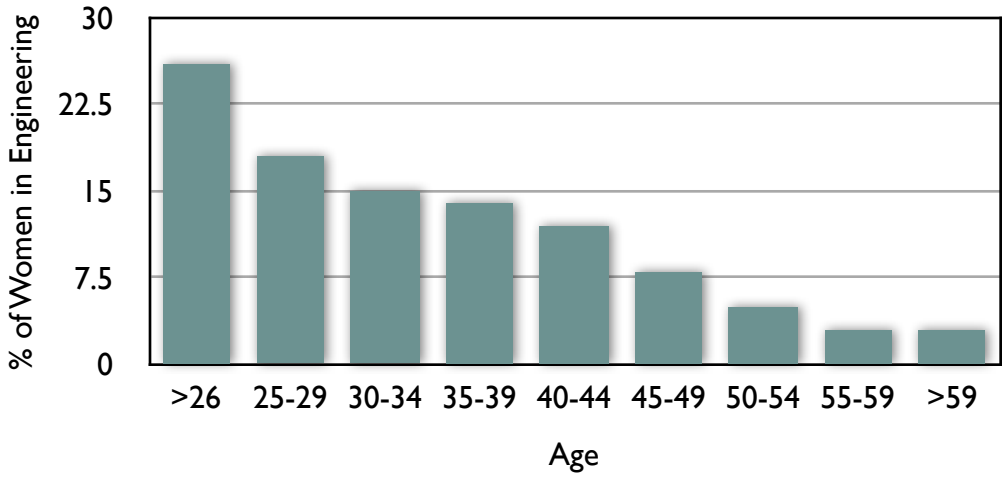


*Figure 6: Women, by age, in all engineerings. Data from NSF's SESTAT, 1999.*

Second, PTF members need to interact better with the local chapters. The demographics at the local chapters tend to be younger than at the annual meetings. Thus, we need to interact with those professionals. Maybe more of us need to offer to give a presentation on our particle technology successes and challenges.

Third, we need to get our young professionals more involved with the inner workings of the PTF. We need to recruit them to be initially co-chairs and then chairs of our PTF sessions at the annual meeting. After that, we need to get them into the PTF committees. Today, we do a poor job of this. All too often, we see the same old chairs and co-chairs for our technical sessions. I am as guilty of this as anyone. However, I would be happy to surrender that seat to a young professional - more than happy. I don't even like chairing or co-chairing. You are always facing the wrong way, which hurts my neck, I never pronounce the names correctly, and I have to drink five cups of coffee just to make sure I don't fall asleep in front of a crowded room. So let all of us make an effort next year to add more young professionals to help us organize our sessions for the next annual meeting.

**Engaging the Industrial Members**

I know the challenges that one faces when trying to attend a meeting if you are in industry. Management does not always see the value. Remind them that it was external communications that inspired industrial inventions such as the Fluidized Catalyst Cracking technology, drug delivery devices, hopper design, diffracting particle size analyzers and nanoparticle technology. Remind them that an invention needs a spark, and that spark is best found in a meeting room full of ideas.

To make the sell easier, think about presenting a paper. It is difficult to present externally in industry and rightfully so. Intellectual Property is the fuel that drives the chemical industry. However, papers don't have to be about IP. Review papers are equally important, and chances are that you have already done one (remember, six months in the lab saves three days in the library).

The PTF needs to be more adaptive here, too. We need to have more tutorial sessions and discussion sessions which are more attractive to our young professionals and Bachelor-level professionals. In addition, the PTF needs to provide more resources for industrial professionals coming into an area of particle technology. We need to better embrace the AIChE's Webinars, provide tutorials from our website, and learning tools for our student population.

**Diversity**

Diversity of our male/female and minority demographics is a tough one. To be honest, I am not sure where the system is broken. Is it because we are weighted to an older demographic where women and minority chemical engineers were lower in numbers during the start of their careers, or is it because we have missed key opportunities to attract women and minorities into the PTF and particle technology?

To start, the PTF should at least be engaged with the AIChE's Women's Initiatives Committee (WIC) and the Minority Affairs Committee (MAC). We should seek insight from their experiences, and we should promote their efforts in our newsletters and on our website.

Next, we need to to make it easier for our women members to become role models. This should not be hard. We have some of the most talented women professionals in the AIChE, both in leadership and in achievements. We need to promote that image.

**Take Home Message**

In short, I have always been impressed with the quality of talent in the PTF. We should not be keeping this a secret from our young professionals, industrial members, or women and minorities. Yet recent demographics suggest otherwise. I believe this is because for too long we have been operating in our own little bubble. The solution is to branch out more, and to make better use of our talent, coupled with AIChE's help. However, the EC will not be able to do this alone. We need your help too.

*Ray Cocco, PTF Chair*

## Committee Chairs

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"I'm going to Disney World"

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Two Position Available!

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Ah-Hyung Alissa Park
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**Accepting Nomination**

**These are two year positions and participants are required to attend the PTF Executive Meeting on the Sunday before the Annual Meeting. Other PTF business matters are typically dealt with via email. Nominations should be sent to Ray Cocco at ray.cocco@psrichicago.com**

**Current Nominees (One Position Available) for PTF Co-Chair**

**Reza Mostofi** (UOP) - Reza has been working at UOP since 2003 where he is responsible for CFD modeling and analysis of different refinery units with emphasis on multiphase flows. Reza is an active member of the AIChE national and Chicago local section. He has served as the Chicago section and PTF area 3B chair and other voluntary positions and is currently actively involved with PTF and CEOC.

**Current Nominees (Two Position Available) for PTF Industrial Liaison**

**Rahul Bharadwaj** (Jenike & Johansen) -Rahul is a Senior R&D/Project Engineer at Jenike & Johanson Inc. He has nearly a decade of experience in the development, validation and application of computational tools in several key industries. He received his M.S. in Mechanical Engineering from the University of Kentucky (2003) and a Ph. D. in Mechanical Engineering from Purdue University (2006). He was previously a Senior Scientist at Pfizer Global R&D where he was responsible for the development of computational models of pharmaceutical processes.

**Bruce Hook** (Dow)- Bruce is a Principal Research Scientist within Performance Materials R&D at the Dow Chemical Company. He has have had experience working in Particle Technology, Reactor Engineering, and Process Development over a 22 year career with Dow Chemical. Additionally, Bruce is part of the PSRI Executive Committee and teaches Particle Technology courses at Texas A&M University as an adjunct faculty.

**Mehrdad Kheiripour** (Merck) - Mehrdad received his Ph.D. degree in Chemical Engineering from City College under the mentorship of Professor Gabriel Tardos with a dissertation on the rheology and flow of powders and granular matter in the intermediate regime of flow. He joined to Merck & Co. Pharmaceutical Technology department in 2011 and is an active member of PTF he is chair/co-chair of three sessions.

**Joerg Theuerkauf** (Dow) - Joerg is a Process Technology Engineer at Dow where he is responsible for development and implementation of advanced technologies in powder technology. He is very active in the European ParDEM project (developing DEM into industrial applicability).

**Current Nominees (Two Position Available) for PTF Academic Liaison**

**Marc-Olivier Coppens** (University College London) -Marc-Olivier has developed a research program that centers on Nature-Inspired Chemical Engineering (NICE). This NICE methodology has led to the invention of nature-inspired approaches to structured fluidized beds, facilitating scale-up and increasing performance, including a naturally scalable, fractal injector, and the emergence of regular bubble patterns by pulsation. Since 2010, he is also the Vice-Chair of the International Committee of AIChE.

**Rajesh Dave** (NJIT) - Rajesh has been involved with serving the AIChE Particle technology Forum for past 12 years He is the Site-Leader, Thrust Leader and a Test-bed Leader, National Science Foundation Engineering Research Center on Structured Organic Particulate Systems (NSF ERC-SOPS), a Rutgers (lead), Purdue, NJIT and UPRM partnership. He is also the founding Director of New Jersey Center for Engineered Particulates.

**Kimberly Henthorn** (Rose-Hulman) - Kim specializes in two-phase microfluidic systems such a gas and solid flow in microfluidic channels and the characterization of particles for biomedical applications. She if active in the AIChE and PTF and is currently the chair of Group 3C.

**Silvina Tomassone** (Rutgers)- Silvina is an active member of the AChE and PTF. She is actively researching the nature of granular flow (dynamics, mass and heat transfer)of anisotropoic particles such as biomaterals and crystals at Rutgers Universtiy. She is co-director of NSF IGERT program adn associate editor of EBM Journal. She has also been the advisor for Rutger's Student AIChE Chapter since 2005.

## JOB POSTINGS ON THE WEB

The PTF is now posting jobs on their website at http://www.aicheptf.org/activities/career-opportunities. The most recent postings are

- Project Engineer for **CPFD-Software,**
- Research Engineering for **Particulate Solid Research, Inc. (PSRI),**
- Senior Engineer for **Cristal Global,**
- Bulk Solids Handling Consultant for **DuPont**, and
- Engineering Science Leader for **Dow Corning.**
- Post-Doctoral Positions at **University of Colorado at Boulder**

Details on job requirements and how to apply can be found on the PTF website. If you have a position available, please send your job posting information to Ray Cocco at ray.cocco@psrichicago.com. It takes about a week to get postings on the web.

## *PTF Treasury Report*

*Prepared by Prof. Ah-Hyung Alissa Park*

| Item | Ref Date | AIChE PTF Account | | Independent PTF Account | |
|---|---|---|---|---|---|
| | | Activity | Balance | Activity | Balance |
| Starting Balance | Jan-12 | | $18,674.48 | | $ 6,190.17 |
| Dues Income | Mar-12 | | $18,674.48 | | $ 6,190.17 |
| AIChE Return (Investment) | Dec-11 | | $18,674.48 | | $ 6,190.17 |
| Due Income | Jun-12 | $ 105.00 | $18,779.48 | | $ 6,190.17 |
| Website Fees | Jun-12 | | $18,779.48 | | $ 6,190.17 |
| PTF Dinner Registration | Jun-12 | | $18,779.48 | | $ 6,190.17 |
| Supplies and Other Expenses | Jun-12 | | $18,779.48 | | $ 6,190.17 |
| AIChE Return (Investment) | Jun-12 | | $18,779.48 | | $ 6,190.17 |
| | | | $18,779.48 | | $ 6,190.17 |
| Totals | | | **$ 18,779.48** | | **$ 6,190.17** |

**The PTF is now sponsoring job searches on the web. Need a career? Need an engineer? Go to**
http://www.aicheptf.org.

New Book! "Dispersion and Mass Transfer Coefficients in Fluidized Beds" by Mayank Kashyap & Dimitri Gidaspow, ISBN 978-3-659-22663-2. Click Here to Buy.

## Conference Calendar

**Southern Workshop on Granular Materials 2012**
December 4-7, 2012, Puerto Varas, Chile
http://www.dfi.uchile.cl/~granular12/granular12/Home.html

**9th International Conference on CFD in the Minerals and Process Industries**
December 10-12, 2012, Melbourne, Australia
http://www.cfd.com.au/cfdconf/

**Trends in Numerical and Physical Modeling for Industrial Multiphase Flows**
September 24 - 28, 2012, Cargese, Corsica, France
http://www.polymtl.ca/gch/cargese2012/index.html

**2012 AIChE Annual Meeting**
Pittsburgh Convention Center
Pittsburgh, PA
October 28 - November 2, 2012
http://www.aiche.org/Conferences/AnnualMeeting/index.aspx

**9th International Conference on CFD in Minerals and Process Industries**
December 10-12, 2012, Melbourne, Australia
http://www.cfd.com.au/cfdconf/

**PARTEC 2013**
International Congress on Particle Technology
April 23-25, 2013, Nuremberg, Germany
http://www.partec.info/

**Fluidization XIV**
May 25 - 30, 2013, Noordwijkerhout, The Netherlands
http://www.engconfintl.org/13afabout.html

**International Conference on Multiphase Flow 2013**
May 26 - 31, 2013, Jeju, Korea
http://www.icmf2013.org/

**2nd IMA Conference on Dense Granular Flows**
June 1 - 4, 2013, Cambridge, UK
http://www.ima.org.uk/conferences/conferen
dense_granular_flows.cfm
Abstract Due Oct 1, 2012

**6th International Granulation Workshop**
June 26 - 28, 2013, Sheffield, UK
http://www.shef.ac.uk/agglom/2013
Abstracts Due Oct 19, 2012

**Gas-Liquid-Solid 11 (GLS-11)**
A Special Symposium for th 9th World Congress of Chemical Engineering
August 19 - 22, 2013, Coex, Seoul, Korea
http://www.wcce9.org/program/program04.asp?sMenu=pro3

**Powders & Grains 2013**
August 19 - 22, 2013, Sydney, Australia
http://www.pg2013.unsw.edu.au/

**2013 AIChE Annual Meeting**
November 17 - 22, 2013 , San Francisco, CA

**The 7th World Congress on Particle Technology**
May 19-22, 2014, Beijing, China
http://www.wcpt7.org
Abstracts Due Oct 31, 2012