



PTF *Newsletter*

Particle Technology Forum

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

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The PTF is an international and interdisciplinary forum that promotes information exchange, scholarship, research, and education in the field of particle technology – that branch of science and engineering dealing with the production, handling, modification, and use of a wide variety of particulate materials, both wet or dry, in sizes ranging from nanometers to centimeters. Particle technology spans a range of industries to include chemical, petrochemical, agricultural, food, pharmaceuticals, mineral processing, advanced materials, energy, and the environment. See www.erpt.org/ptf for more information.

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GREETINGS FROM THE CHAIR



As you can see from this newsletter and the following paragraphs, the PTF Executive Committee has been active in promoting membership in PTF, training prospective officers, mentoring junior members, and seeking opportunities to advance understanding in particle technology.

I represented the AIChE and the Particle Technology Forum with an informational table at the **International Powder & Bulk Solids Technology Forum** on May 5-8. This innovative forum brought a wide range of educational opportunities to technologists with little training in particle technology. Participants were interested to hear what our Forum and the AIChE could do to help their careers. I enjoyed hearing Brian Kaye (our PTF Forum Awardee for 2002) talk on mixing and blending and reflect on his career in particle technology. Unfortunately he died several weeks later. A tribute to his career is included in this newsletter. I plan to represent the PTF at **PARTEC-POWTECH 2004, the International Congress of Particle Technology**, in Nuremberg, Germany, March 16-18, 2004.

The PTF Newsletter has received institute-wide recognition by winning the **2003 Marx Isaacs Award for a Division/Forum Newsletter**. At the PTF Awards Banquet we shall present the award token (an engraved paperweight) to our editor, Christine Hrenya, as the person most responsible for this achievement. We are all grateful for this improved communication.

Shrikant Dhodapkar (PTF Liaison for Area 3) and our five technical programming chairs (see the PTF Web site) worked hard to structure and fill our **2003 Topical Conference on Engineered Particles**. Participation in the AIChE's spring meeting was low, and the environment for making commitments for November was difficult as members had to submit presentation proposals while the Iraq conflict was at its peak. In spite of that we filled all the assigned sessions in the Topical Conference, and we are assured of a fine meeting in San Francisco. Through the efforts of Al Weimer (vice chair of the PTF), a recently-proposed forum (Energetic Materials) was allowed to run several sessions as a new program group (3e).

Plans for the **2006 World Congress on Particle Technology** are under development. You may follow progress by visiting the Web site at www.erpt.org/wcpt5/default.htm. We shall need a lot of hosts, session chairs, and presentations to make this a success, so put this meeting on your long range calendar and consider where your volunteer effort could help us host a great meeting while expanding your international network of colleagues.

In the last newsletter I reported a membership increase of 20%. Unfortunately that was based on a report from HQ that included nonpaying members held over from 2002. The truth is that our membership has remained constant at about 350. Read this newsletter and imagine how much more we could do if we had twice as many colleagues in the PTF! Please encourage your colleagues and students to join the PTF, to participate in managing our technical sessions, and to get to know us at the awards banquet. **We help members strengthen the capabilities and credentials that are vital for their careers.**

– Dr. Ralph Nelson, PTF Chair

BRIAN H. KAYE REMEMBERED

Brian H. Kaye was born in Hull, Yorkshire, England, in 1932. He passed away on July 9, 2003, at the Sudbury Regional Hospital in Ontario, Canada, after a short illness. He was educated at the University College of Hull, and completed BSc, MSc, and PhD degrees in Physics at the University of London, England, between 1953 and 1962. He spent four years working at the Atomic Weapons Research Establishment at Aldermaston. His experience working with the powder metallurgy of the atomic bomb and nuclear fuel rods, and his research into atomic fallout from a nuclear bomb, forged a lifelong interest and passion for powder and aerosol technology. He was actually present at a test detonation of an atomic bomb in Woomera, Australia.



Brian Kaye next to his invention, the AeroFlow Instrument

He came to the Nottingham and District Technical College – now Trent University – in 1959 as a Lecturer in Physics. He started a research group there. I met him for the first time in the autumn of 1959. I had recently completed a BSc in Chemistry and Physics at the University of London on part-time day release from the National Coal Board (NCB). I had been given permission to continue part-time day release studies towards a research degree. We met by accident! I fully expected to do an MSc in Physical Chemistry, but the lecturer had forgotten the appointment. Instead, I was shuttled upstairs to meet this new lecturer in Physics—Brian Kaye—and in 10 minutes flat, he persuaded me to do research in particle technology.

My life was changed forever. The path I was now on would lead to my emigration to the United States and a career with E. I. du Pont de Nemours and Company. It would also provide me with additional lifelong friends such as Professor Brian Scarlett and Dr. Terry Allen from that same research group.

Brian Kaye left Nottingham in 1962 and joined the British Whiting Company in Welwyn Garden City. He was later recruited by the Illinois Institute of Technology Research Institute (IITRI) in Chicago as a Senior Physicist in the Fine Particles Research Group of Chemistry Division. He arrived on American shores via the Queen Elizabeth on the day that John F. Kennedy was assassinated in Dallas.

In 1966, I received a telephone call from him, inviting me to dinner in Reading, England. He offered me a job working with him on a multi-sponsored industrial research program in particle characterization. It was sponsored by 32 companies including E. I. du Pont de Nemours and Company. I arrived on June 30, 1967, and we worked together for one year before he moved to the Laurentian University in Sudbury, Ontario, Canada, where he worked for the rest of his life. He consulted on the IITRI project for a while, so we remained in close contact. I remember standing with him on the top floor of IITRI's research tower watching Chicago burn as a result of riots following Martin Luther King's assassination. We commented that we were a long way from Nottingham!

I moved to Du Pont in 1975, and our contacts diminished, until the day came when we hardly saw each other at all. We met occasionally at the Nürnberg conferences, or at the Fine

News and Announcements

Particle Society (FPS) meetings (he was a founding member of FPS in 1968) or at the Bulk Solids Handling conferences in Chicago. Meeting him was always like the first time. I was struck by the power of his personality.

Brian Kaye was a catalyst. He initiated reactions in audiences wherever he appeared. Young people followed him as if he was the legendary Pied Piper. He was a success as a scientist. He was a success as a Methodist preacher. He was a success as a teacher and a writer. He could have been an equal success as a stand-up comedian in the Working Men's Clubs in the north of England. He was by nature an entertainer, an orator, a storyteller. Most of us can recall the streams of people flowing into auditoria anywhere in the world where Brian Kaye was presenting a seminar or plenary lecture. We all knew that he would be provocative, funny, and well worth spending an hour with.

His technical achievements were many. He published well over 100 papers. He was a consultant to many companies from chemical to pharmaceutical to food. He was a prolific teacher, presenting international workshops in most areas of particle technology. He was a teacher of Physics and through a series of popular books, brought some of science's new ideas to the general public in a very readable and humorous style. How could one not be intrigued by a book entitled "Golf Balls, Boomerangs and Asteroids—the Impact of Missiles on Society" or "Science and the Detective—Readings in Forensic Science" or his latest book in preparation "Chaos, Catastrophes and Spherical Chickens". Throughout these books he illustrated his fascination for language and for the written word. In particular, he loved pointing out the root meaning and derivation of words. We all remember his crusade that "Fineparticle" should be one word. He was founding editor of the journal "Powder Technology." He was North American Editor of "Particle and Particle Characterization." He was on the Editorial Board of KONA, Japan.

In July 2002, he reached his 70th birthday. That September, Professor Brij Moudgil invited him to the University of Florida as an Eminent Visiting Scholar, where Brian Scarlett, Terry Allen, Brij Moudgil and I could give him and his wife an afternoon of personal tribute for his birthday. That evening and the next day, we generated a little nostalgia. We had dinner at the "Sovereign" Restaurant, and afternoon tea at the "Cameo Tearoom." We had afternoon tea from a "real" English tea service – Brian and Phyllis were pleased.

In November, the Particle Technology Forum of AIChE awarded him the "Lifetime Achievement Award in Particle Technology." How fortunate and timely these two events proved to be.

I was shocked by the news of his death. I was in England and Germany for several weeks and did not receive the news until I returned in late July. Upon reflection, I realized that I had known Brian Kaye for close to 45 years. He gave me the opportunities of a lifetime. I stood with him during turbulent times in Chicago and was privileged to stand with him once again in Florida last autumn—the last autumn of his life.

With Brian's passing, some sparkle has gone from the particle science and technology community. I do not know where I would have been without that chance meeting in Nottingham – certainly somewhere very different. Thank you Brian. Rest in peace!

Professor Reg Davies
Advisor, University of Florida
Visiting Professor, Leeds University, England

**PTF NEWSLETTER IS NOW
“AWARD-WINNING”**



Last year at this time we had not seen a PTF newsletter in several years. In July 2002 at the World Congress on Particle Technology in Sydney, Australia, I was reminded by Dr. Ulrich Teipel (Deputy Director of the Fraunhofer Institute) that the newsletter is vital for the international visibility of PTF as well as serving as a significant member benefit for those who cannot attend the AIChE Annual Meeting. As I spoke with PTF members at the WCPT5 about this Prof. Christine Hrenya (University of Colorado, Boulder) volunteered to edit a revived newsletter, Mark Bumiller (Vice President of Marketing for Malvern Instruments) offered to facilitate the printing and publishing of the first issue, and several other PTF members agreed to submit material. The result was very attractive and informative, and a second issue was published this past spring.

Our AIChE liaison, Anette Ngijol (who helps us achieve and reward high quality), reminded the PTF executive committee of the impending deadline for submitting entries (seven copies of the two issues) to the Mark Issacs Award for best division/forum newsletter (managed by the national AIChE's Public Awareness Committee). Selection criteria include: Effectiveness of communication (clarity, humor, and presentation), Content, Innovation, and Quality.

Our vice chair, Al Weimer, submitted the nomination and copies, and the PTF Newsletter was selected as the winner of the Mark Issacs Award. I received the award in June and I shall bring it to the Annual Meeting for all PTF members to appreciate – and for Christine Hrenya – our nationally-acclaimed editor – to keep. This was an excellent team effort, and I encourage all Executive Committee members and programming leaders to consider articles or leads that you could contribute during your term of office.

– Dr. Ralph Nelson, PTF Chair

Additional Note:

A special thank-you is also extended to Ellen Romig, a staff member at the University of Colorado, without whom this newsletter would not be possible!

– Professor Christine Hrenya, PTF Editor



PTF AWARD WINNERS

The PTF is pleased to recognize the following recipients of the PTF 2003 Awards:

PTF Lifetime Achievement Award (sponsored by DuPont) – **Prof. Chi Tien** (Syracuse University)

Thomas Baron Award in Fluid-Particle Systems (sponsored by Shell) – **Prof. Sotiris Pratsinis** (ETH-Zurich)

Lectureship Award in Fluidization (sponsored by Fluor Daniel) – **Prof. Norman Epstein** (University of British Columbia)

Fluidized Processes Recognition Award (sponsored by Dow Chemical) – **Prof. Hamid Arastoopour** (Illinois Institute of Technology)

Best Ph.D. Award in Particle Technology (sponsored by Proctor & Gamble) – **Dr. Stephen Tallon** (Univ. of Auckland, New Zealand)

All of these deserving recipients will be presented their Awards at the PTF Chinese Banquet Dinner at the Yank Sing Restaurant in downtown San Francisco, Tuesday, November 18 (open bar at 6:30, dinner at 7:30)

PTF AWARDS BANQUET



The PTF Banquet Dinner will be held at 7:30 pm (open bar at 6:30 pm) at the Yank Sing Restaurant, 101 Spear Street at Mission in downtown San Francisco on Tuesday, November 18. The cost is \$58 and all attendees **must** sign up during their **early registration** for the AIChE meeting. A final attendance needs to be given to the restaurant 5 days prior to dinner and so it will be impossible to sign up for the dinner during the AIChE Meeting! **This is an event you will not want to miss.** The Yank Sing is one of the best Chinese restaurants in San Francisco. The dinner includes smoked beef shank, jellyfish salad, char siu, crab claw, prawn and scallop balls, supreme sharkskin soup, velvet filet mignon tenders, crispy spring chicken, crabmeat shiitake ragout, honey-glazed Chilean sea bass, braised soft noodles, chilled mango pudding, and Chinese hot tea. Come join friends and professional colleagues for a super evening at the Yank Sing Restaurant.

Please attend the PTF Chinese Banquet Dinner on Tuesday, November 18, at the Yank Sing Restaurant in downtown San Francisco.

**2003 AIChE Annual Meeting:
Topical Conference on
Engineered Particle Systems:
Synthesis, Processes and
Applications**



November 16-21, San Francisco Hilton & Towers, San Francisco, CA
URL: <http://www.aiche.org/conferences/annual/>

Day of Week	Start Time	Session Title	Location
Monday	8:00 AM	Population Balance Modeling in PF Processes: Nucleation, Aggregation and Breakage Kernels	Franciscan B – Hilton Hotel
Monday	3:15 PM	Structural Models of Complex Particle Agglomerates and Assemblages	Union 23 – Hilton Hotel
Monday	3:15 PM	Gas Phase Synthesis of Particles: In Memory of Phil Morrison II	Continental Ballroom 9 – Hilton Hotel
Tuesday	8:00 AM	Characterization of Engineered Particles	Union 17 – Hilton Hotel
Wednesday	8:00 AM	Surfactants in Particle Formation Processes from Liquid or Slurry	Imperial A – Hilton Hotel
Monday	12:30 PM	Gas Phase Synthesis of Particles: In Memory of Phil Morrison I	Continental Ballroom 9 – Hilton Hotel
Monday	8:00 AM	Fundamentals of Fluidization and Fluid Particle Systems: In Honor of Professor Arthur Squires	Union 17 – Hilton Hotel
Monday	12:30 PM	Turbulent Fluidization	Union 23 – Hilton Hotel
Monday	12:30 PM	Circulating Fluidized Beds and Their Applications	Lombard – Hilton Hotel
Wednesday	8:00 AM	Gas-Liquid-Solid Fluidization	Taylor B – Hilton Hotel

News and Announcements

Day of Week	Start Time	Session Title	Location
Tuesday	3:15 PM	Novel Instrumentation Techniques for the Characterization of Gas-Solid Systems	Van Ness – Hilton Hotel
Thursday	8:00 AM	Novel Fluidized Bed Applications	Taylor B – Hilton Hotel
Wednesday	3:15 PM	Combustion in Fluidized Bed Systems	Van Ness – Hilton Hotel
Tuesday	8:00 AM	Computational and Numerical Approaches in Particle Flows	Lombard – Hilton Hotel
Tuesday	12:30 PM	Fine Particle Fluidization: Flow and Fluidization of Nanoparticles	Van Ness – Hilton Hotel
Tuesday	3:15 PM	Agglomeration, Granulation and Novel Fluidized Bed Applications	Taylor B – Hilton Hotel
Tuesday	12:30 PM	Discrete Element Modeling and Molecular Dynamics for Particles Systems	Taylor B – Hilton Hotel
Monday	12:30 PM	Dynamics and Modeling of Particulate Systems I	Union 17 – Hilton Hotel
Tuesday	8:00 AM	Solids Handling and Processing	Van Ness – Hilton Hotel
Tuesday	3:15 PM	Mixing and Segregation in Particulate Systems	Union 24 – Hilton Hotel
Tuesday	3:15 PM	Process Monitoring and Control of Particulate Processes	Imperial B – Hilton Hotel
Thursday	8:00 AM	Wet and Dry Comminution Processes for the Production of Fine Particles	Sutter A – Hilton Hotel
Wednesday	12:30 PM	Scale Up of Particulate Processes	Van Ness – Hilton Hotel
Friday	8:00 AM	Molecular Self Assembly of Nanoparticles	Union 24 – Hilton Hotel
Thursday	12:30 PM	Liquid Phase Synthesis of Nanomaterials and Particles	Yosemite B – Hilton Hotel
Thursday	12:30 PM	Separation Processes for Nanoparticles	Continental Ballroom 9 – Hilton Hotel

News and Announcements

Day of Week	Start Time	Session Title	Location
Thursday	3:15 PM	Nanoscale Sensing for Biological and Environmental Applications	Continental Ballroom 9 – Hilton Hotel
Friday	12:30 PM	Nanoparticle Formation for Electronic and Optical Applications	Continental Ballroom 1 – Hilton Hotel
Friday	3:15 PM	Advances in Nanostructured Ceramic Films	Continental Ballroom 1 – Hilton Hotel
Wednesday	8:00 AM	Panel Discussion on Education in Particle Technology	Van Ness – Hilton Hotel
Thursday	12:30 PM	Properties and Processing of Energetic Materials I	Sutter A – Hilton Hotel
Friday	8:00 AM	Environmental Restoration of Energetic Materials	Union 23 – Hilton Hotel
Thursday	7:00 PM	Poster Session: Advances in Particle Technology	Grand Ballroom A – Hilton Hotel
Monday	3:15 PM	Dynamics and Modeling of Particulate Systems II	Union 17 – Hilton Hotel
Thursday	3:15 PM	Properties and Processing of Energetic Materials II	Sutter A – Hilton Hotel
Co-sponsored by Group T4			
Thursday	12:30 PM	Solids Handling in Food and Pharmaceutical Industries (Compaction, Tableting, Matrix)	Continental Ballroom 1 – Hilton Hotel
Wednesday	3:15 PM	Fluid Particle Interactions in the Pharmaceutical Industry I	Continental Ballroom 1 – Hilton Hotel
Thursday	12:30 PM	Nanoparticles for Drug Delivery I	Imperial B – Hilton Hotel
Monday	12:30 PM	Coating and Encapsulation in Pharmaceutical Processes	Continental Ballroom 2 – Hilton Hotel
Thursday	3:15 PM	Supercritical Fluids for Food and Pharmaceuticals	Continental Ballroom 1 – Hilton Hotel
Thursday	3:15 PM	Nanoparticles for Drug Delivery II	Imperial B – Hilton Hotel

PTF BYLAW PROPOSALS



To ensure strong representation of both academic and nonacademic interests the PTF has traditionally

- 1) elected half of the Executive Committee from nonacademic institutions and half from academia
- 2) rotated the position of vice chair (and thus the chair) between academic and nonacademic members.

The Executive Committee feels that this practice should be formalized by explicit inclusion in our Bylaws. You may see all the PTF Bylaws on the Web at

<http://www.erpt.org/ptf/bylaws.htm>

The following amendments will be proposed for adoption at the general membership meeting of the PTF during the AIChE annual meeting in November 2003.

#1. Amend Article IV, Section 1. Governance by replacing the first sentence,

"The PTF will be governed by an Executive Committee consisting of nine individuals elected by and from the general membership."

with the following

"The PTF will be governed by an Executive Committee consisting of four academic representatives (elected by the general membership from members in the academic professions), four nonacademic representatives (elected by the general membership from members in the nonacademic professions), the chair and vice chair (elected by the Executive Committee as specified elsewhere), and the immediate past chair. Each Executive Committee member shall have only one vote, and the chair may vote only to break a tie."

#2. Amend Article IV, Section 2. Election and Term of Office by replacing the first sentence,

"The term of office will be four years with four or five of the Executive Committee members standing for office at the Annual Meeting."

with the following

"The term of office shall be four years, with four of the Executive Committee members standing for office at Annual Meetings in even-numbered years."

#3. Amend Article IV, Section 4. Officers by replacing the first two sentences,

"Officers of the Executive Committee consist of a Chair, Vice Chair, Secretary, and Treasurer. These are elected for two-year terms from among all members who have served on the Executive Committee in the last six calendar years, with the Vice Chair automatically succeeding to the Chair."

with the following

"Officers of the Executive Committee shall consist of a Chair, Vice Chair, Secretary, and Treasurer. All officers have two-year terms. At the start of the first Executive Committee that includes newly-elected Executive Committee members the Vice Chair shall automatically succeed to the Chair. In years evenly divisible by four the Vice Chair shall be elected from all academic representatives who have served on the Executive Committee in the last six calendar years. In the intervening terms the same conditions apply but for nonacademic, rather than academic, representatives. The Secretary and Treasurer shall be elected from the incumbent Executive Committee members."

–Dr. Ralph Nelson, PTF Chair

WCPT5



Announcing...

World Congress on Particle Technology 5 **Orlando, Florida – USA** **April 23-27, 2006** **Walt Disney World – Swan and Dolphin Hotel**

Every four years, members of the world's particle technology research community converge somewhere in the world to share their latest insights and developments in the diverse field of particle technology.

In April 2006, these experts from around the globe will meet in Orlando, Florida-USA, for what will be the 5th World Congress on Particle Technology. Hosting the upcoming conference will be the American Institute of Chemical Engineers.

WCPT-5 will follow in the proud tradition of the previous meetings and offer a concentrated agenda on powder technology, including educational advancements and industrial exhibits of the latest equipment for handling, measuring, and processing powders of all types.

WCPT-5 will be divided into five tracks of discussion, which will be represented in the concurrent meeting sessions. You will be able to easily follow one track of mixed tracks.

Tracks will include

- ◆ Particle and Bulk Powder Characteristics
- ◆ Particle Design, New Technologies and Industrial Applications
- ◆ Powder Handling and Multi-phase Flow
- ◆ Solid-Fluid Separation Processes
- ◆ Education

Abstract Deadline: September 1, 2005

For more information, contact

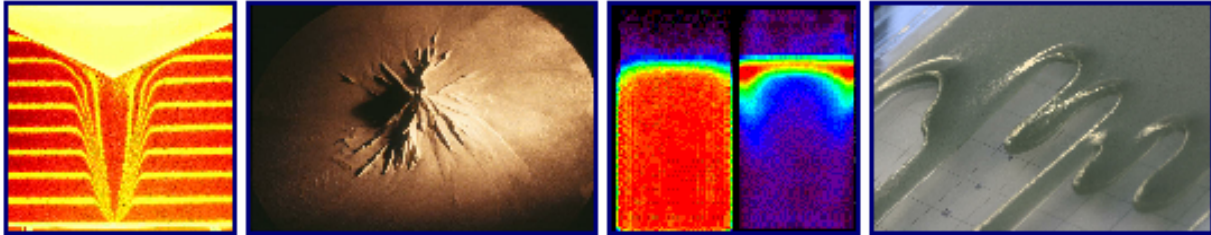
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GORDON RESEARCH CONFERENCE



Announcing...

**2nd Gordon Research Conference
on Granular and Granular-Fluid Flow
June 27-July 2, 2004
Colby College, Maine**

Flows involving granular materials and fluids are crucial to a number of industrial, geophysical and planetary phenomena. The field is now experiencing rapid progress thanks to worldwide research in engineering and physics. The objective of the second Gordon Conference on Granular and Granular-Fluid Flows is to provide a forum for exchanges among active contributors to the subject. Invited speakers will provide a focus for discussions on topics such as granular mechanics, suspension rheology, gas-solid flows, static granular materials, flow regimes, patterns, segregation, kinetic theory, and instabilities.

Website: http://web.mit.edu/peko/www/granular_GRC_2004.html

Organizing Committee

Prof. Michel Louge (Chair	:	myl3@cornell.edu
Prof. Christine Hrenya (Vice Chair):	:	hrenya@colorado.edu
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Prof. Thorsten Poeschel	:	thorsten.poeschel@charite.de
Prof. Troy Shinbrot	:	shrinbrot@coewww.rutgers.edu

SUMMER SCHOOL IN WINTER AT PERC



The challenge in advanced training in particle science and technology is that there are many specialized areas, and no single institution can reasonably be expected to have expertise in each of these areas. To meet this challenge, the Particle Engineering Research Center (PERC) at the University of Florida has developed a program to connect students from across the globe with experts in the field. The annual Particle Science Summer School in Winter (SSIW) at the PERC offers students the opportunity to choose two out of eight specialized 2-day modules taught by world-renowned experts, participate in a poster session, and attend a series of special topic seminars. The modules that will be offered during the upcoming SSIW 2003 program are: Biotechnology, Powder Processing, Modeling, Interfacial Phenomena, Nanotechnology, Particle Processing, Characterization, and Engineered Particulates.

FAQ:

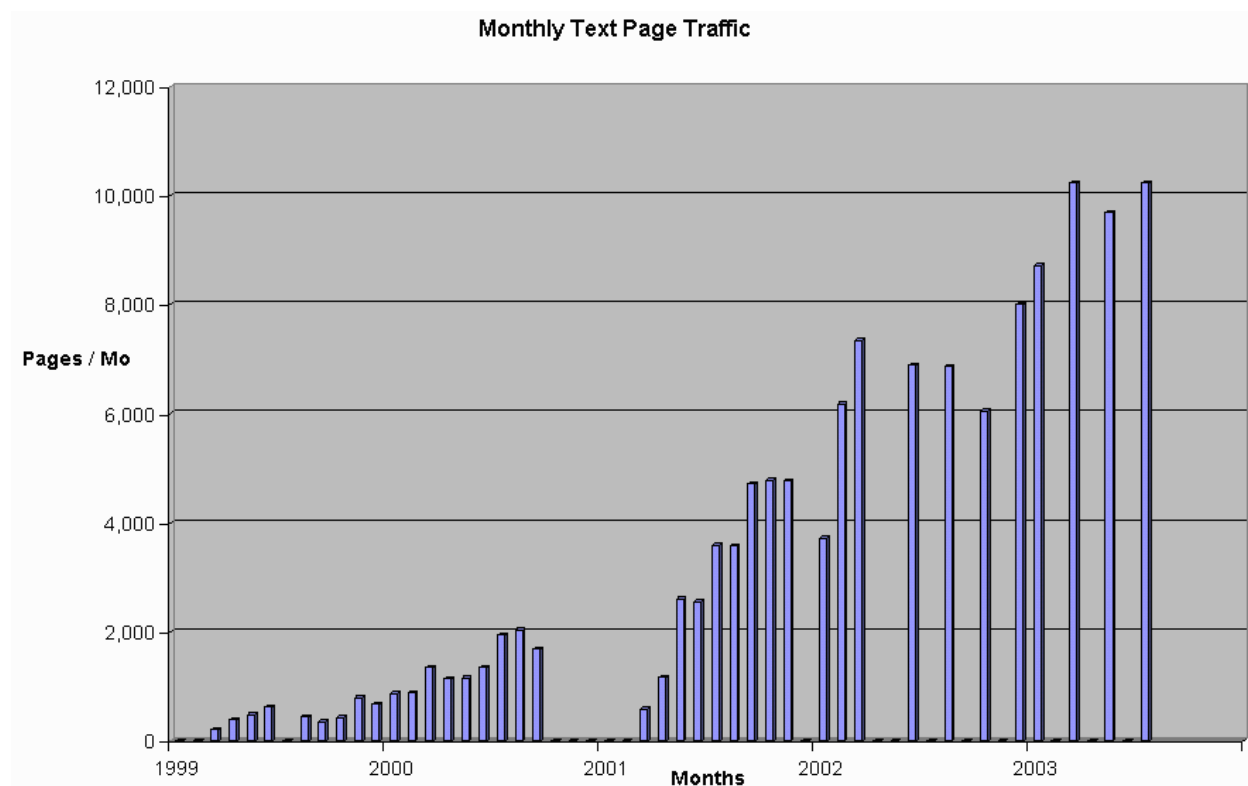
- **WHEN IS IT?**
January 10-17, 2004
- **WHERE IS IT?**
University of Florida, Gainesville, Florida.
- **WHO CAN PARTICIPATE?**
Any graduate student working in a particle science and technology area is eligible. Previous student participants represented nine different academic departments.
- **WHAT DOES IT COST?**
If you are studying at a U.S. Institution and are selected to participate you will receive a grant to support your travel and local living costs for the program. Up to 50 students will be selected to receive this support. There is no registration fee.

If you are a student at a non U.S. Institution, you must pay for your own travel and local living expenses (estimated to be approximately \$350 U.S. based on double hotel accommodations). Previous SSIW students have been sponsored by their faculty, home institution or industry to attend. There is no registration fee.
- **HOW DO I APPLY?**
Use the on-line application (<http://www.erc.ufl.edu/education/ssiw/>) to apply. If you are at a foreign institution, please indicate the source of support for your participation.
- **QUESTIONS?**
E-mail Dr. Anne Donnelly at adonnelly@erc.ufl.edu or Ms. Rhonda Blair at rblair@erc.ufl.edu.

UPDATE ON EDUCATIONAL WEBSITE



In 1998, frustrated by the lack of college courses in particle technology, the Particle Technology Forum initiated the development of a tutorial Web site, with a goal of posting 400 tutorials equivalent to three hours of junior-level instruction. *Educational Resources for Particle Technology* was launched in the spring of 1999 with Web hosting help from the Univ. of Florida. In 2001 *ERPT* moved to its own address at www.erpt.org and continues to attract authors and readers and to draw requests for consultants. The following chart shows how usage has increased since startup.



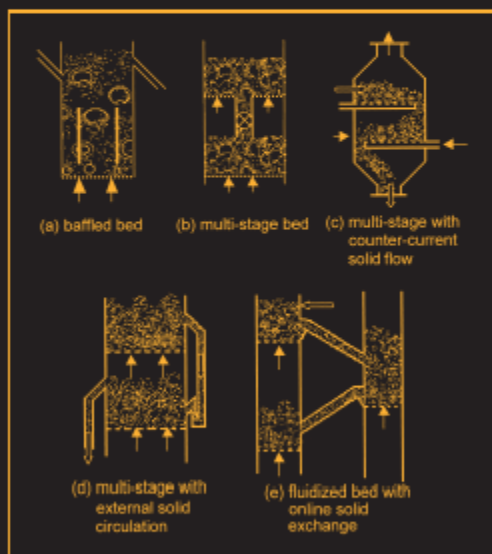
The months showing zero traffic are months where traffic statistics were not available due to various system problems. The gap and drop in 2000-2001 were due to the move to a new URL.

If you have tutorial material that might be included either through posting on the *ERPT* site or by a link to material on another site, please contact Ralph Nelson at erptmged@aol.com.

–Dr. Ralph Nelson,
Managing Editor of ERPT

New Fluidization Text

HANDBOOK of FLUIDIZATION and FLUID-PARTICLE SYSTEMS



edited by
Wen-Ching Yang

about the book . . .

This reference details particle characterization, dynamics, manufacturing, handling, and processing for the employment of multiphase reactors, as well as procedures in reactor scale-up and design for applications in the chemical, mineral, petroleum, power, cement, ceramics, pharmaceutical, and biotechnological industries—covering techniques in instrumentation, measurement, and modeling for optimal performance of fluidization and fluid-particle systems.

The *Handbook of Fluidization and Fluid-Particle Systems* analyzes the packing characteristics of spherical and nonspherical particles. . . pressure drop correlations for fixed beds and fluidized beds. . . the effects of temperature and pressure on system operation. . . powder classifications. . . interparticle forces in fluidized beds. . . heat and mass transfer phenomena. . . methods to estimate entrainment flux. . . grid and plenum design criteria. . . the effects of internal components such as baffles, tubes, packings, and inserted bodies. . . the mechanisms of attrition. . . jetting phenomena and correlations. . . particle segregation. . . turbulent, circulating, and nonconventional fluidized beds. . . pneumatic transport. . . cyclone separators. . . liquid–solid separators. . . standpipe and nonmechanical valves. . . and liquid and three-phase fluidized beds.

about the editor . . .

WEN-CHING YANG is Advisory Engineer, Siemens Westinghouse Power Corporation, Pittsburgh, Pennsylvania. The author, coauthor, editor, or coeditor of numerous journal articles, book chapters, and books, he holds 10 patents and is a Fellow of the American Institute of Chemical Engineers and a member of the American Chemical Society. The recipient of the Fluor Daniel Lectureship Award in Fluidization (2000) and the Dow Chemical Fluidized Processes Recognition Award (1993), Dr. Yang received the B.S. degree (1962) in chemical engineering from the National Taiwan University, Taipei, Taiwan, the M.S. degree (1965) in chemical engineering from the University of California, Berkeley, and the Ph.D. degree (1968) from Carnegie Mellon University, Pittsburgh, Pennsylvania.

Printed in the United States of America



ENERGETIC MATERIALS FORUM



It is interesting how things get started. I was a volunteer at the AIChE Officers Conference in Washington, D.C. in June 2000, and talking to one of the attendees from Cape Canaveral, FL. He spoke of the need for a group within AIChE to focus on rocket propellants. About a year later I spoke with Chester Clark, from the Naval Surface Weapons Center (NSWC), Indian Head, MD about the need and they thought it was a good idea. I put some preliminary information together on the issue, finding no other organization that met the goals, showed it to AIChE and the NSWC. Several people volunteered to help. Support grew over the next year and we had our first national meeting, at the AIChE National Meeting in November 2002. From that meeting, Al Weimer offered the support of the PTF, which we gratefully accepted, becoming Group 3e, Energetic Materials. The Energetic Materials Group has a web site: <http://www.ench.umd.edu/EMF/> which we encourage you to visit to learn more about the group, the members, and our future plans. I will summarize the highlights:

Several members of AIChE, in cooperation with representatives from AIChE headquarters, industry, government and academia, are creating a new Energetic Materials Group (EMG) as part of the Particle Technology Forum. The EMG will focus on individual professional development, information collection, and distribution, in the areas of formulation, scaleup, manufacturing, implementation, monitoring, environmentally acceptable disposal, and future needs development of the combined community of engineers and scientists who are developing and applying sound scientific and engineering-based theories and practices to energetic materials. Energetic Materials include but not limited too: energetic reactions, explosives, propellants, and pyrotechnics. Technical interest includes: Manufacturing R&D, manufacturing, processing, physical properties, disposal, environmental impacts, life cycle, a viable workforce of the future, developing long range plans for the energetic materials community, advancing state of the art, reactions.

The goals and objectives of the EMG are to:

1. Provide a forum for communication and networking among those with an interest in the energetic materials.
2. Identify and address the professional needs of practicing scientists, engineers, academics, business and design managers, R&D modelers, and others interested in energetic materials.
3. Establish a network of personnel and organizations that identify and resolve issues relating to energetic materials.
4. Coordinate, sponsor, cosponsor, and advertise relevant programming, including cross-cutting and special-initiative technical sessions and conferences.
5. Promote interchange of ideas, concepts, know-how, and experiences in energetic materials sciences and engineering.
6. Encourage educators at all levels, particularly in chemical engineering, to integrate concepts of energetic materials sciences and engineering into their curricula.

News and Announcements

7. Advocate curricula that prepare students for career energetic materials sciences and engineering.
8. Promote lifetime learning through workshops and short courses.
9. Provide centralized links to technical publications, computer programs, and databases related to the energetic materials sciences and engineering.
10. Coordinate with other interested organizations and associations.

The EMG plans to have our first session at the November, 2003: Energetic Materials Group Annual Meeting, AIChE Annual Meeting, San Francisco, CA. as part of the Particle Technology Forum.

Sessions:(Under the Particle Technology Forum Group 3e)

i) Energetic Materials, Properties and processing Chair Constance M. Murphy, Continuous Twin-Screw Processing Project Manager, Indian Head Division, Naval Surface Warfare Center (NSWC) , 101 Strauss Avenue, Indian Head, MD 20640-5035, 301-744-6497 (Voice), 301-744-4843 (Fax), MurphyCM@ih.navy.mil, Co-chair Dr. Vladimir Hlavacek,

This session focuses on DoD and industry research and development needs concerning the properties and processing of energetic materials for use in rockets, pyrotechnics and other applications. Academia, government and private contractors are invited to present papers on a variety of topics to include: particle size issues such as measurement, and shape; particle manufacture including crystal growth; processing of very highly solid filled systems; bonding agents; processing aids such as viscosity reducers; material flow properties/rheology and mathematical modeling; electrostatic discharge and other safety issues; heats of reaction; kinetics; heat transfer; and mass transfer.

ii) Energetic Materials, Environmental issues: Chair Rebecca Ortiz, Air Force Center for Environmental Excellence, U.S. Air Force, HQ AFCEE/ERC, 3300 Sidney Brooks, Brooks AFB, TX 78235-5112, 210-536-5230, Rebecca.Ortiz@brooks.af.mil, Co-Chair Charles R. Painter. This session focuses on DOE, DoD, and industry research and development needs for environmental restoration of unexploded ordnance (UXO) and energetic material components. Academia, government, and private contractors are encouraged to present papers on a variety of topics to include: mechanisms of transport, chemical behavior, remediation technologies for TNT, RDX, HMX or perchlorate, physical identification of surface and sub-surface ordnance, phytoremediation, in-situ remediation, high order/low order destruction of UXO, and other environmentally related issues impacting restoration of energetic materials in water, air, soil, or as surface residue.

If you are interested in participation or becoming a member, please visit our web site, or contact one of the following: - Chair: Bruce Cranford, P.E., Dept. EMF, 1 Cliffe Hill Ct., Potomac, MD 20854. 301-873-9087, Bruce-Cranford-PE@attglobal.net

- Vice Chair: Chester Clark, Senior Associate CAD/PAD Joint Program Office Naval Surface Warfare Center (NSWC) , Indian Head, MD 20640, Phone 301-744-6702, ClarkCF@ih.navy.mil

–Bruce Cranford,
Chair of Energetic & Materials Forum

“Know Floe’s Korner”



“Know Floe’s Korner” is a contribution from the members of Group 3c (Solids Handling and Processing). The objective of this section is to share their industrial learning experiences through a variety of articles and case studies. Please send your comments to Shrikant Dhodapkar at sdhodapkar@dow.com.

Ten Common Myths and Misconceptions About Solids Handling

Shrikant Dhodapkar, Lyn Bates, George Klinzing

- Misconception:** Increasing airflow rate (or providing more Oomph! to the system) will increase conveying capacity.

Reality: Increasing airflow rate in dilute phase systems will decrease conveying capacity (for the same pressure drop).
- Misconception:** Pickup velocity or Saltation velocity is a fundamental property of a material.

Reality: It also depends on pipe size and solids loading. Higher velocity required for larger line size and higher loading.
- Misconception:** Pneumatic conveying lines can be routed much like utility (air or steam) lines in the plant.

Reality: Good design practice for pneumatic conveying system requires sufficient straight run after pickup, minimization of bends or directional changes, avoidance of back-to-back bends and avoidance of inclined lines.
- Misconception:** Suitable cone angle for bin design (for mass) is same as angle of repose or angle of internal friction or angle of slide.

Reality: It is indirectly related to these measurements. Bins designed with such practices need special insurance.

5. **Misconception:** Stress at the outlet of a large silo (say 150 m³) is much higher than a small silo (say 15 m³) with same outlet dimension.

Reality: For mass flow design, the stresses in the vicinity of the outlet are largely independent of the overall size of the silo. This does not hold true for funnel flow silos.

6. **Misconception:** Mass flow hoppers result in "plug flow" as observed by uniform draw down of the top surface.

Reality: Mass flow hoppers have extensive mixing in the hopper zone due to velocity gradient. Mixed volume depends on hopper geometry and velocity profile in the hopper.

7. **Misconception:** Overall collection efficiency of a cyclone defines the performance of a design.

Reality: Overall efficiency strongly depends on the particle size distribution of incoming dust. "High Efficiency" cyclone designs rated at "99.9% efficiency for coarse particles" may collect only 50% of the incoming particulate - if the incoming dust is finer.

8. **Misconception:** More residence time in a mixer results in better mixing.

Reality: The mixture quality reaches an asymptotic limit after certain duration. The quality of mixture depends on the mixer design and compatibility between mixing mechanism in the mixer and the mixture. Extended mixing can result in attrition or fines generation, which then segregates and results in poor mixture quality.

9. **Misconception:** One can plot particle size distributions obtained from various particle size analyzers on the same plot for comparison as long as they are converted to the same type of distribution (number, surface or volume/mass).

Reality: Various particle size analyzers use different physical measurements to extract the particle size information. They are not always comparable or transformable from one to the other. Stick with one instrument for all measurements in a given process to avoid confusion.

10. **Misconception:** It is possible to drain the static charge from polymer pellets stored in a box or a container by inserting a grounding rod into it or grounding the metal container.

Reality: Static charge on insulating material can not be drained instantly even if the container is grounded or a grounding rod is inserted. The charge decay relies on surface resistivity of the polymer.

Upcoming Conference Calendar



2003

AAAR (American Association for Aerosol Research Annual Meeting)

October 20-24, 2003, Hilton Anaheim Hotel, Anaheim, California

Abstract Deadline: Passed

Website: <http://www.aaar.org/03AnnualConf/03ConfInfo.htm>

2nd International Conference on Computational Methods in Multiphase Flow

November 3-5, 2003, Santa Fe, NM

Chairs:

A. A. Mammoli, University of New Mexico, email: mammoli@me.unm.edu

C. A. Brebbia, Wessex Institute of Technology, email: wit@wessex.ac.uk

Website: <http://www.wessex.ac.uk/conferences/2003/multiphase03/index.html>

AIChE Annual Meeting: PTF Topical Conference on “Engineered Particle Structures: Manufacture, Processing, and Characterization”

November 16-21, 2003, San Francisco, CA

Chairs:

Michael F. Malone, University of Massachusetts, email: aiche03@ecs.umass.edu

Maria Burka, National Science Foundation, email: mburka@nsf.gov

Abstract Deadline: Passed

Website: <http://www.aiche.org/conferences/annual/>

Southern Workshop on Granular Materials

December 10-13, 2003, Pucón, Chile

Organizing Committee:

Marcel Clerc, Universidad de Chile

Patricio Cordero, Universidad de Chile

Fernando Lund, Universidad de Chile

Francisco Melo, Universidad de Santiago

Rodrigo Soto, Universidad de Chile

Abstract deadline: Passed

Website: <http://www.dfi.uchile.cl/swgm03/>



2004

PARTEC 2004

March 16-18, 2004, Nuremberg, Germany

Executive Committee:

Sortiris Pratsinis, ETH, Zurich
H. Cremer, GVC (past chair)
A. Gutsch, Degussa (chair 2007)
W. Peukert, TU München (chair 2010)

Abstract Deadline: Passed

Website: <http://www.ptl.ethz.ch/partec2004/>

Fluidization XI

May 9-13, 2004, Ischia (Bay of Naples), Italy

Co-Chairs:

Professor Umberto Arena, Dipartimento di Scienze Ambientali, Seconda Università degli Studi di Napoli, email: umberto.arena@unina2.it

Dr. Riccardo Chirone, Istituto di Ricerche sulla Combustione, Consiglio Nazionale delle Ricerche, email: chirone@irc.na.cnr.it

Prof. Michele Miccio, Dipartimento di Ingegneria Chimica e Alimentare, Università degli Studi di Salerno, email: mmiccio@unisa.it

Prof. Piero Salatino, Dipartimento di Ingegneria Chimica, Università degli Studi di Napoli Federico II, email: salatino@unina.it

Website: <http://www.engconfintl.org/4afboby.html>

Gordon Conference on Granular and Granular-Fluid Flows

June 27-July 2, 2004, Colby College, Waterville, Maine

Chair:

Professor Michel Louge, Cornell University, email: michel.louge@cornell.edu

Vice-Chair:

Professor Christine Hrenya, University of Colorado, email: hrenya@colorado.edu

Website: <http://www.grc.uri.edu>

XXI International Congress of Theoretical and Applied Mechanics

August 15-21, 2004, Warsaw, Poland

Co-Chairmen:

Michal Kleiber, IPPT PAN, email: michal.kleiber@ippt.gov.pl

Wlodzimierz Kurnik, Technical University of Warsaw, email: wku@simr.pw.edu.pl

Abstract Deadline: January 9, 2004

Website: <http://ictam04.ippt.gov.pl>



AIChE Annual Meeting

November 7-12, 2004, Austin Convention Center, Austin, TX
(details will be available in February 2004)

2005

Powders and Grains 2005

July, 2005, Stuttgart, Germany,

Organized by Dr. H. J. Herrmann, email: hans@ical.uni-stuttgart.de

Annual AIChE Meeting

(details unavailable)

2006

The Fifth World Congress on Particle Technology

April 23-27, 2006, 2006, Orlando FL

Chairs:

George Klinzing, University of Pittsburgh, email: klinzing@engr.pitt.edu

Ralph Nelson, Educational Resources for Particle Technology, email:
ERPT@aol.com

Abstract Deadline: September 1, 2005

Annual AIChE Meeting

November 12-17, San Francisco Hilton, San Francisco, CA
(details will be available in February 2004)

Officer and Committee Listing

Officers:

Chair 2002-2004: Dr. Ralph D. Nelson, erptmged@aol.com, 302-239-0409
Vice-Chair 2002-2004: Professor Alan Weimer, alan.weimer@colorado.edu, 303-492-3759
Immediate Past Chair 2000-2002: Prof. George Klinzing, klinzing+@pitt.edu, 412-624-0784
Secretary 2002-2004: Professor Hugo Caram, hsc0@lehigh.edu, 610-758-4259
Treasurer 2002-2004: Prof. Richard Turton, turton@cemr.wvu.edu, 304-293-2111, ext. 2145

Liaisons:

Academic 2004-2006: Professor Hugo S. Caram, hsc0@lehigh.edu 610-758-4259
Academic 2004-2006: Professor Brij Moudgil, BMoudgil@erc.ufl.edu 352-846-1194 x 225
Academic 2000-2004: Professor Richard Turton, turton@cemr.wvu.edu, 304-293-2111
Academic 2000-2004: Professor Thomas R. Blake, blake@ecs.umass.edu, 413-577-6606
Industry 2004-2006: Professor Manuk Colakyan, colakymc@dow.com, 304-747-4580
Industry 2004-2006: Dr. Costas Coualaloglou, costas.a.coualaloglou@exxonmobil.com
Industry 2000-2004: Dr. Paul Mort, mort.pr@pg.com, 513-627-8876
Industry 2000-2004: Dr. Shrikant Dhodapkar, sdhodapkar@dow.com, 979-238-7940
AIChE-CTOC: Esin Gulari, egulari@nsf.gov, 703-292-7026
AIChE Staff Associate: Mr. Richard Green, richg@aiche.org, 212-591-8677

Standing Committees (Chairs):

Awards Committee 2002-2004: Professor Alan Weimer, alan.weimer@colorado.edu,
303-492-3759
Membership: Dr. Manuk Colakyan, colakymc@ucarb.com, 304-747-4580
Newsletter Editor: Professor Christine Hrenya, hrenya@colorado.edu, 303-492-7689
Educational Resources for Particle Technology: Prof. George Chase, gchase@uakron.edu,
330-972-7943

Technical Programming Area Liaison and Group Chairs

<u>Position</u>	<u>Person</u>	<u>Affiliation</u>
Area 3 Liaison	Dr. Shrikant Dhodapkar	The Dow Chemical Co.
Area 3 Vice Liaison	Dr. Ralph D. Nelson, Jr.	DuPont, retired
<i>Group 3a – Particle Production and Characterization</i>		
Chair	Dr. Paul Mort	Procter & Gamble Co. ITC
Vice Chair	Prof. Rajesh N. Dave	New Jersey Inst. of Techn
<i>Group 3b – Fluidization and Fluid-Particle Systems</i>		
Chair	Dr. Manuk Colakyan	The Dow Chemical Co.
Vice Chair	Prof. T.C. Ho	Lamar University
<i>Group 3c – Solids Flow, Handling, and Processing</i>		
Chair	Prof. George Klinzing	Univ. of Pittsburgh
Vice Chair	Dr. Clive Davies	Industrial Research Ltd
<i>Group 3d - Nanoparticles</i>		
Chair	Prof. Rajesh N. Dave	New Jersey Inst. of Techn
Vice Chair	George Fotou	Cabot, Inc
<i>Group 3e – Energetic Materials</i>		
Chair	Bruce Cranford, P.E.	EMF Co.
Vice Chair	Chester Clark	Naval Surface Warfare Center

REPORT FROM THE TREASURER



The transactions for the PTF account from the time period 01/01/03 through 07/31/03 are given in the table below:

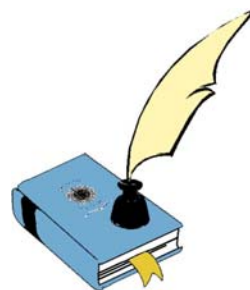
Description of Transaction	Transaction Amount	Balance
Total Transferred to Morgantown Account	\$ 13,868.86	\$ 13,868.86
<u>Expenses 01/01/03 – 07/31/03</u>		
Website maintenance	\$ 359.10	
PTF Newsletter expenses	\$ 637.52	
Brochure publishing costs for WCPT5	\$ 751.00	
New check costs	\$ 56.75	
Deposit to Tank Sing Rest - AIChE PTF Awards Dinner	\$ 2,000.00	
Total expenses for this period	\$ 3,804.37	\$ 10,064.49

At the beginning of 2003, I took over as treasurer from Al Weimer. The above accounting represents the transactions that have occurred during my tenure as treasurer. The balance of the account on 12/31/02 was given in the previous PTF newsletter as \$13,998.86. Of this amount, \$13,868.86 was transferred in two transactions to the new account in Morgantown, each transaction cost \$15, and the remaining \$100 is in the old account in Colorado. The reason for keeping the Colorado account open is to facilitate operations for the WCPT5 conference in Orlando in 2006.

It should be noted that the above records show only expenses that required payment from the account administered by the PTF treasurer. During the same period, there were expenses, dues, and contributions from companies, all of which were handled through the AIChE head office. Currently, we owe the AIChE \$407.42 but we are expecting some company contributions that are outstanding for 2002. I will report on this matter and give a fuller accounting at the end of FY2003.

Respectfully submitted,
Richard Turton, Treasurer

FROM THE EDITOR'S DESK



The *PTF Newsletter* is published twice a year as a vehicle for communication for all PTF members. PTF members are encouraged to send in news and information of general interest to PTF members. Please address your communication to

Professor Christine M. Hrenya
Department of Chemical Engineering
University of Colorado
Boulder, CO 80309-0424
Tel: (303) 492-7689; Fax: (303) 492-4341
email: hrenya@colorado.edu

If you would prefer to continue receiving a hard copy of the newsletter instead of the electronic version, please send a note to this effect to the following address:

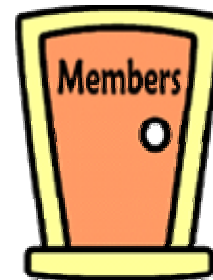
Annette Ngijol
Local Sections & Divisions/Forums Staff Associate
AIChE, 3 Park Avenue
New York, NY 10016
email: anets@aiiche.org

Advertisements may also be placed in the newsletter. The rates on a per issue basis are:

1/4 page \$40

1/2 page \$60

Full page \$110



MEMBERSHIP INFORMATION

YES, I am interested in the Particle Technology Forum. Please accept my request for membership.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____ Country _____

Phone _____ Fax: _____

Are you an AIChE member? Yes No Member # _____

Other Society Affiliations? _____

Credit Card Information Visa _____ Master Card _____

Number _____ Exp. Date _____

Membership rates

_____ \$10 AIChE Member

_____ \$20 Engineering/Scientific Society Member

_____ \$65 Non-Society Member

_____ \$5 Student

Signature _____

Checks must be payable to American Institute of Chemical Engineers. International money orders are acceptable.

Check must be drawn on a U.S. bank or draft on a foreign bank with a New York City branch.

Mail to: AIChE, Particle Technology Forum

Attn: Document Processing, 3 Park Avenue, New York, NY 10016

MOVING? NEW E-MAIL?



Help us get PTF news to your new address by filling in and e-mailing a change of address form. See the PTF web page at

<http://www.erpt.org/ptf/addrchng.txt>