

PARTICULARS

Newsletter of the American Association for Aerosol Research

Winter 2006

Welcome to a New Edition of *Particulars*!



On behalf of the current Newsletter Committee, I would like to take the opportunity to thank the outgoing editor, Cindy Twohy, for her effectiveness and direction during the last year. Both Cindy, and Mike Hannigan before her, are tough acts to follow.

We continue our effort to make the newsletter a useful resource to the AAAR community (in addition to reminding you when the abstract and early bird registration deadlines are). To that end, I spoke with some of you at the recent IAC in St. Paul about suggestions for improvement. Unfortunately, much as I would enjoy

adding a gossip column to *Particulars*, I would have to change fields. Because my personal survey was very limited in scope, I encourage all of you to take the opportunity to complete the AAAR membership survey recently announced via e-mail. A link to the survey is also available on the (recently re-designed) AAAR home page. There are newsletter-related questions in the survey that Britt, Pramod, and I would very much appreciate receiving your answers to. You are also welcome, of course, to e-mail me directly. Thanks.

Katharine Moore
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CALL FOR NOMINATIONS

We're Seeking Nominations

As immediate past president of AAAR, one of my responsibilities is chairing the nominating committee for board members. The nominating committee develops a slate of candidates that then appear on the spring ballot. We are looking for candidates who have experience in the organization serving on or chairing committees or working groups. If you would like to nominate yourself or a colleague, please send me an e-mail.

Thanks, Anthony Wexler
aswexler@ucdavis.edu
Immediate Past President, AAAR

AAAR 26th Annual Conference

The 26th Annual Conference of the AAAR will be held September 24–28, 2007, at the Grand Sierra Resort, Reno, Nevada. In addition to the high quality technical presentations that have been the hallmark of the AAAR conferences, the Reno area offers numerous opportunities to explore the eastern gateway to the Sierra Mountains. A Web site for abstract submissions will be open by mid-February 2007. The abstract submission deadline will be March 31, 2007. This will be a firm deadline with all subsequent submissions considered for presentation as “late breaking posters” only. Plan to join your colleagues in Reno next fall!



President's Message

Pratim Biswas
President

This is my first report to you as president of AAAR, and I look forward to a fruitful year. I must state at the outset that AAAR is a member driven organization, so please keep your ideas, thoughts and comments coming – this will help make us a better organization.

While the term of the president is just one year, the work begins a couple of years prior – with the election as vice president-elect. I would like to thank Tony Wexler, the immediate past president, and Sonia Kreidenweis, the previous immediate past president. I have rather large shoes to fill! They leave the association in very good shape, and have also played leadership roles in improving the organizational and operational structure. A big thanks to both of them! I also look forward to working with Chris Sorensen, the current vice president, and the members of the Executive Committee and the entire board to keep AAAR moving on to newer heights.

Our biggest activity as an association is the Annual Conference – of course, this year, it was special in more ways than one. AAAR was the host association for the 7th International Aerosol Conference, and it also marked our Silver Jubilee Year.

The 7th International Aerosol Conference in St. Paul, Minn., was by far the largest attended aerosol meeting – with 1,247 registered attendees. There were close to 1,200 papers presented – both in Platform and Poster Sessions. There were several symposia organized that addressed several topical issues.

The pre-conference History Symposium was well attended. The Industry Forum on Nanoparticle Technology went overtime—well into the break. There was a lot of discussion and many good ideas emanated. The first Aerosol Education Symposium attracted a lot of attention, and the software that was distributed will be helpful to many a member. Several planning meetings were organized – one discussing the next Aerosol Science and Technology Workshop that was attended by several individuals, including those from government agencies such as NSF, EPA, DOD, NASA, and the National Academies. The objective of such a workshop would be to develop roadmaps for research and how we could further increase the visibility of the discipline. The award ceremonies recognized several talented individuals for their pioneering contributions. The social events were also a lot of fun – the pre-conference tour, the conference dinner coupled with a Mississippi River Cruise, and the Fuchs reception at the Science Museum of Minnesota, to name a few.

I must also end by thanking all the sponsors who graciously supported the conference – and this exceeded the \$125,000 mark for this meeting! And kudos to all the members of the Conference Organizing Committee for a job very well done.

AAAR also turned 25, and there was a keynote speech given by Dr. Friedlander – where the future directions of the field and the potential of aerosol science and technology was highlighted. This was followed by a celebration – and it was great to see all the past presidents march up to the podium (each got garlanded with a 1GB USB memory stick). Clearly, this is a landmark for AAAR, and we all should be proud of the progress made – in research, education, and our growth as an association. Let us work together to make the next 25 years even more fruitful and productive!

What are some of the things that we should be looking forward to? The board at its Friday meeting discussed several such activities. How can we become a more visible organization and further promote activities related to aerosol science and technology? Items such as initiation of an AAAR fellows program; creation of an AAAR foundation or endowment; promoting the young researchers program; creation of student chapters; promoting student attendance and recognition with poster awards; setting up mutual agreements with other associations; more effective use of the Web site (check out the new look of our Web pages – www.aaar.org); and other member benefit programs were discussed. As you can see there are several ideas, and we hope to pursue some of these and report back to you all. Another thing that we have to work on is the renewal of the association management contract, and I will be working with Chris Sorensen and Tony Wexler on this important task.

I would like to end by thanking the AAAR staff who ensure that things run smoothly in the association. Specifically, Amy Williams, executive director – who makes sure things get done in a timely manner, and constantly reminds us of our responsibilities. Ann Mitchell, a great meeting manager, ensures that the conferences run smoothly. And, Deanna Bright, who answers every e-mail you send to info@aaar.org. They also have a great sense of humor – and that makes working with them an extra pleasure (or should I say they pretend to enjoy my jokes to keep me humored!).

How do you measure nanoparticle exposure?



Leading experts believe that lung-deposited surface area is the relevant measurement metric for quantifying nanoparticle exposure and related health effects. The Model 3550 Nanoparticle Surface Area Monitor provides a simple and fast solution for measuring the surface area dose of particles in the range from 10 to 1000 nm. It measures lung-deposited surface area corresponding

to tracheobronchial and alveolar regions of the lung. The Model 3550 is an important instrument for research in the fields of inhalation toxicology, health effects, and epidemiology, and for measuring and monitoring workplace exposure.

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International Aerosol Conference Successfully Completed

By: Gilmore J. Sem and David Y. H. Pui, conference co-chairs

We are proud to announce the IAC 2006, completed September 10-15, in St. Paul, Minnesota, was a success! It was, by far, the largest scientific aerosol conference ever held, with 1,247 attendees from 41 countries participating:

United States	721
Korea	67
Finland	64
Germany	64
Japan	56
United Kingdom	32
Switzerland	23
Taiwan	22
Canada	21
France	20
Sweden	20
Netherlands	18
Italy	16
Spain	16
Israel	10
26 other countries	77
 Total	 1,247

United States attendance was led by 116 from Minnesota, 109 from California, 53 from New York, and 46 from North Carolina. The other countries were Australia, Austria, Belgium, Chile, China, Czech Republic, Denmark, Estonia, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Kenya, Lithuania, Mexico, New Zealand, Nigeria, Poland, Portugal, Russia, Singapore, Slovenia, South Africa, and Thailand.

The events began with 28 participants, led by Tyler Beck, on an unforgettable Boundary Waters Canoe and Camping Trip into the wilderness region on the border between Minnesota and Ontario. Meanwhile, 49 of us participated in the 2-day Third Symposium on the History

of Aerosol Science. The 16 tutorials had 667 attendees, led by 65 at biokinetics and toxicology of nanoparticles with no fewer than 24 at any one.

Each day, Monday through Friday, began with a plenary session led by an expert in the field. The technical sessions, with oral platform presentations and posters, began Monday morning and continued with surprisingly strong attendance through late Friday afternoon. The two abstract books contained about 1,200 abstracts for the IAC conference, plus 34 for the history symposium. Each attendee also received a CD containing all abstracts.

The conference dinner was served one evening on a large Mississippi River cruise boat, with the dock just across the river from the conference hotel. The Fuchs Award reception was held in the Science Museum of Minnesota, about three blocks down the street from the conference hotel. Another evening, many enjoyed tours of the 3M Company, Donaldson Company, MSP Corporation, University of Minnesota Particle Technology Laboratory, or TSI.

A number of awards were made to deserving persons. They are described elsewhere in this newsletter. We want to express our sincere appreciation to the very many people who helped make IAC 2006 a success. Special recognition goes to Prof. Pratim Biswas and Prof. DaRen Chen for their outstanding service as technical co-chairs. Patricia Keady served as local arrangements chair. Tyler Beck served as exhibition chair. The AAAR home office personnel, particularly Amy Williams and Ann Mitchell, made chairing the conference much easier – we greatly appreciate all they did to make it a success. Finally, we appreciate the attendance of so many of you – thank you sincerely!

The next International Aerosol Conference will be held in 2010 in Helsinki. We both look forward to attending IAC 2010 as ordinary participants!

“In Case You Missed It”

Organic Aerosols and Global Climate Change

In a recent review paper by Fuzzi et al. on the role of organic aerosols in climate change, the authors state that “organic aerosol (OA) components account for a large, sometimes even dominant, fraction of air particulate matter,” and that “they influence the physical and chemical properties of aerosol particles and thus have effects on the atmosphere and climate through interaction with reactive trace gases, water vapor, clouds, precipitation, and radiation.” (Fuzzi, S. et al., *Atmospheric Chemistry and Physics* 6: 2017-2038)

Strategies for Stable Nanoparticle Dispersions

In a paper published in *Science*, Mackay et al. show that thermodynamically stable dispersion of nanoparticles into a polymeric liquid is enhanced for systems where the radius of gyration of the linear polymer is greater than the radius of the nanoparticle. Generally the dispersion of particles in polymeric materials is difficult and frequently results in phase separation and agglomeration. (Mackay et al., *Science*, 311(5768):1740 - 1743)

Inject Aerosols to Stabilize the Climate?

According to climate scientist Tom Wigley, global warming for the next 20 years can be reduced by directly injecting sulfur dioxide aerosol into the stratosphere in concert with cuts in greenhouse gas emissions. The research published in an October issue of *Science*, uses computer models to demonstrate that injecting sulfate aerosols at intervals from one to four years would have about the same cooling effect as that of 1991 eruption on Mount Pinatubo in the Philippines. (Wigley, T.M.L., *Science*, 314 (5798): 452 - 454)

US EPA Adopts New PM Air Quality Standards

On September 21, 2006, the U.S. Environmental Protection Agency (EPA) announced new, revised National Ambient Air Quality Standards (NAAQS) for PM_{2.5} and PM₁₀. The EPA has strengthened its previous daily PM_{2.5} standard by reducing the allowable concentration from 65 µg/m³ to 35 µg/m³, however the annual PM_{2.5} standard remains unchanged at 15 µg/m³. The existing daily PM₁₀ standard remains at 150 µg/m³, however the annual PM₁₀ standard has been revoked. According to the EPA, the available evidence does not suggest an association between long-term exposure to PM₁₀ at current ambient levels and health effects. States must meet the revised standards by 2015, with a possible extension to 2020. (<http://epa.gov/pm/naaqsrev2006.html>)

UK Government Publishes Progress Report on Nanoparticle Risk

This month, the Department for Environment, Food, and Rural Affairs of UK Government has published a progress report on possible risks posed by engineered nanoparticles to human health and the environment. This effort is intended to contribute evidence for regulators and provide a source of information for both researchers seeking funding and the funding agencies. The report identifies following five key aspects of nanotechnology risk assessment research: 1) Metrology, characterization, standardization and reference materials; 2) Exposure – sources, pathways, technologies; 3) Human health hazard and risk assessment; 4) Environmental hazard and risk assessment; 5) Social and economic dimensions of nanotechnologies.

(www.defra.gov.uk/environment/nanotech/research/reports/index.htm)



AAAR Would Like to Welcome the Following New Members:

*denotes student member

Aamir Abid*, University of Southern California	Benjamin Corris*, University of Manchester	In-Kyu Han*, University of Medicine & Denistry of NJ
Sandeep Agnimotri, University of Tennessee, Knoxville	Edward Crandall, University of Southern California	Matthew Hart, Naval Research Laboratory
Allison C. Aiken*, University of Colorado	Eben Cross*, Boston College & Aerodyne Research, Inc	Linda Hattier*, University of Iowa
Henry Ajo, University of Minnesota	Michael Cubison, University of Colorado	Mike Hebert, Donaldson Company, Inc
Kirankumar Alapaty, DOE	Daniel Curtis, University of Iowa	Brian Henz, Army Research Lab
M. Lizabeth Alexander, Pacific Northwest National Lab	Mark Davis, Environmental Systems Products	Lisa Herschberger, Minnesota Pollution Control Agency
Senthilvelan Anantharaman, University of Minnesota	Kim DeBruijne*, University of North Carolina	April Hiscox*, University of Connecticut
Robert Anderson, TSI Inc.	John Dixon*, University of Minnesota	Steven Sai Hang Ho, Desert Research Institute
Fredric C. Arnold, U.S. EPA	Anne Donnelly, SEAGEP	Justin Hoey*, North Dakota State University
Sarjit S. Bains, TSI Inc.	Marcus Drayton*, University of Minnesota	Kevin Hommema, Battelle
Kirk Baker, Lake Michigan Air Directors Consortium	Edward Dunlea, University of Colorado	Wei-Chun Hsieh*, Georgia Institute of Technology
Krishanu Banerjee*, Clarkson University	Tracie L. Durbin, Sandia National Laboratories	Joshua A. Hubbard*, University of Texas at Austin
Ameya Bapat*, University of Minnesota	Seth Ebersviller*, University Of North Carolina	Jeffrey Jaeckels*, University of Wisconsin
Soubir Basak*, Washington University	Yehya Elsayed, Donaldson Company, Inc	Derek Jones, Donaldson Company, Inc.
David Benson*, Kent State University	Gabriella Engelhart*, Carnegie Mellon University	Soonkyu Jung*, University of Illinois, Urbana-Champaign
Josef Beranek*, University of North Dakota	Keith Esch, RTI International	Alicia Kalafut*, University of Iowa
Allan Bertram, University of British Columbia	Jennifer Esker*, University of Utah	Ki-tai Kang*, Hanyang University
Anil Bika*, University of Minnesota	Morteza Eslamian*, University of Toronto	Tom Kennedy, TSI Inc.
Fredi Birsan*, Indiana University	Greg Evans, University of Toronto	Jorma Keskinen, Tampere University of Technology
Poonam Boparai*, University of Illinois at Urbana-Champaign	James Farnsworth, TSI Incorporated	Chungman Kim*, University of Minnesota
Michael Boy, NCAR	Annelise Faulhaber, University of California, Riverside	Seung Won Kim*, University of Minnesota
Steven G. Brown, Sonoma Technology, Inc	Gustavo Fernandes*, Yale University	Sun-Man Kim*, Hanyang University
Nancy Burton, NIOSH	Jay A. Fournier, Philip Morris USA	Kevin Klungtvedt, RinTek
Paul Butler, NIST	Neil Frank, U.S. EPA	David S. Kohl, BWXT Y-12
Pedro Campuzano Jost, University Of British Columbia	Luke Franklin*, University of Minnesota	Hideya Koizumi, Oak Ridge National Laboratory
Patricia Castellanos*, University of Maryland	Andrew Freedman, Aerodyne Research, Inc.	Kevin Krause, TSI Inc.
Bean T. Chen, CDC/NIOSH	PengFei Gao, NIOSH	Jesse Kroll, Aerodyne Research, Inc.
Yingjun Chen, Georgia Institute of Technology	Elizabeth Gibson*, University of Iowa	Vinit Kumar Mishra*, Cape Peninsula University of Technology
Xi Chen*, Clarkson University	Stefania Gilardoni, University of California	Tylor Lahren*, University of North Dakota
Anne Cheymol, Royal Meteorological Institute of Berlin	Krystal Godri*, University of Toronto	Hartawan Laksmono*, Ohio State University
Madalina Chirila, NIOSH	Allen H. Goldstein, University of California, Berkeley	Andrew Lambe*, Carnegie Mellon University
Hyeok Chung*, Hanyang University	Carlos A. Gonzalez, NIST	Jin-Hwa Lee*, University of Florida
Thomas Cleary, NIST	Heather Gorenz*, Sandia National Laboratories	Mikko Lemmetty*, Tampere University of Technology
Sonya Collier*, University of Southern California	Neha Gowadia*, University of California, Irvine	
	Sagar Goyal, University of Minnesota	
	David Grass*, Columbia University	
	Melissa Grose, TSI Inc.	

- Lin Li*, Washington University
Ying Li*, University of Florida
Yong Lim*, University of California, Riverside
Long-Full Lin*, National Cheng Kung University
Liming Lo*, University of Minnesota
Worth Longest, Virginia Commonwealth University
Ganhua Lu*, University of Wisconsin
Xiaoyan Ma, Environment Canada
Shannon Mahurin, Oak Ridge National Laboratory
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Arthur Stuempfle, OptiMetrics, Inc
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Goshka Szczodrak, University of Miami
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2006 FUCHS MEMORIAL AWARD RECIPIENTS



The Fuchs Memorial Award was established in honor of the great aerosol scientist, Prof. Nikolai Albertovich Fuchs (1895-1983) of Russia, during the 1986 International Aerosol Conference in Berlin. It is jointly sponsored by the following three aerosol societies:

- The American Association for Aerosol Research
- The Japan Association for Aerosol Science and Technology
- The Gesellschaft für Aerosolforschung

The Fuchs Memorial Award is given every four years in recognition of exceptionally meritorious research contributions to the field of aerosol science and technology. The award is intended as a continuing recognition of Professor Fuchs' contributions to the international scientific community, as well as a means of encouraging the same high standards among contemporary scientists in conducting aerosol research.

The first Award was presented to Prof. Sheldon K. Friedlander of the University of California in Los Angeles at the 1990 International Aerosol Conference in Kyoto, Japan. The second Award, presented at the 1994 International Aerosol Conference in Los Angeles, was to Prof. Othmar Preining of the University of Vienna and Prof. Benjamin Y. H. Liu of the University of Minnesota. The third Award was presented to Prof. John H. Seinfeld of the California Institute of Technology at the 1998 International Aerosol Conference in Edinburgh, Scotland. The fourth Award, presented at the Sixth International Aerosol Conference in Taipei, Taiwan, in 2002, was to Prof. Kikuo Okuyama of Hiroshima University and Prof. Alex A. Lushnikov of the University of Helsinki.

The recipients of the fifth Fuchs Memorial Award are Prof. Richard C. Flagan of the California Institute of Technology and Prof. Peter H. McMurry of the University of Minnesota. The Award was presented at the Seventh International Aerosol Conference, held September 10-15, 2006, in St. Paul, Minnesota.



Richard C. Flagan

Prof. Flagan's contributions to the field of aerosol science span atmospheric aerosols, combustion-generated aerosols, health effects, aerosol processing of materials, bioaerosols, aerosol dynamics, and especially, aerosol instrumentation. He has published more than 250 papers that span a wide range of experimental and

theoretical aspects of aerosol science and technology. His many contributions to aerosol measurement include the invention of the scanning electrical mobility spectrometer, better known by its commercial name – the scanning mobility particle sizer; an instrument that is used by aerosol scientists around the world. His instrumentation research goes beyond invention to identify and resolve the limitations of the methods, and has extended the methods of aerosol science to such diverse problems as the search for evidence of hidden explosives in luggage and the sampling and analysis of interplanetary dust. His past and ongoing research on aerosol measurements sets the stage for both further instrumentation development and for advancing understanding of both atmospheric and technological aerosols. He has invented new approaches to aerosol synthesis of materials, and applied them to diverse applications such as fine ceramics and aerosol-nanoparticle-based memory devices. Together, his instrumentation and aerosol technology research has led to 16 patents. Prof. Flagan has probed the dynamics of atmospheric aerosols through both chamber experiments and a wide range of field studies. The laboratory studies have been instrumental in unraveling the chemistry leading to secondary organic aerosol production and quantifying the yields of these particles from a wide range of anthropogenic and biogenic hydrocarbons. Field studies have probed both direct and indirect radiative forcing of climate and aerosol/cloud interactions. His work on airborne allergens has explained how allergens originating in pollen particles that are too large to penetrate past the nose or throat can reach the lower airways to trigger asthmatic attacks.



Peter H. McMurry

Professor McMurry has carried out experimental and theoretical work on atmospheric aerosols, semiconductor contamination control and plasma synthesis of nanoparticles and nanophase materials. His first research topic was nucleation in the presence of an aerosol, which Sheldon Friedlander suggested as a thesis topic,

and which has continued to be a rich problem throughout his career. His initial work focused on theory and numerical modeling, but he soon concluded that progress would require substantial improvements in measurement capabilities. He subsequently focused on instrumentation and atmospheric observations, and is now returning to theory. Contributions of his group include development of the ultra-fine condensation particle counter (now available commercially from TSI), which helped to enable the discovery by many groups that new particle formation occurs frequently throughout the atmosphere. He is currently working with colleagues at NCAR and the University of Minnesota to develop measurement methods (Cluster-CIMS, TDCIMS) to better understand chemical processes that lead to the formation of clusters by homogeneous nucleation and their subsequent growth to larger sizes. Another theme of McMurry's research has been the development of methods to accurately measure physical and chemical properties of morphologically and chemically complex particles, such as those found in the atmosphere. This work led to the development of the TDMA as a quantitative measurement tool and its application to the atmosphere for measuring water uptake and mixing characteristics, the use of multiangle light scattering (MALS) to study particle shape and refractive index, and the development of the DMA-APM, DMA-APM-TEM and DMA-APM-ATOFMS methods for studies of particle density, dynamic shape factors, and composition. His work on semiconductor contamination control led to the development of the particle beam mass spectrometer (PBMS). Key to the success of the PBMS was the invention of aerodynamic lenses, which have been commercialized and used as inlets to particle mass spectrometers.

In recognition of their seminal contributions to aerosol research and education, and their outstanding service to the aerosol community, the Awards Committee is pleased to present Prof. Flagan and Prof. McMurry with the fifth Fuchs Memorial Award, on behalf of the three sponsoring aerosol societies.

Awards Committee

John Seinfeld, Chair
Helmuth Horvath
Gerhard Kasper

Benjamin Y. H. Liu
Kikuo Okuyama
Yoshio Otani

2006 IAC Award Winners

In addition to the Fuchs Memorial Award, five other awards/prizes were awarded during the annual conference. They include: the Thomas T. Mercer Prize (excellence in pharmaceutical aerosols and inhalable materials), the David Sinclair and Kenneth T. Whitby Awards (excellence in aerosol research by an established and young scientist, respectively), the Sheldon K. Friedlander Award (outstanding dissertation) and the Benjamin Y.H. Liu Award (outstanding contribution to aerosol instrumentation and experimental techniques). Congratulations to the awardees pictured here!

Thomas T. Mercer Joint Prize given by AAAR and ISAM to Myrna Dolovich (not pictured) — accepted on her behalf by Ronald Wolff as Tony Wexler looks on in support.



David Sinclair Award given by AAAR to Juan Fernandez de la Mora



Kenneth T. Whitby Award given by AAAR to Jamie Schauer



Benjamin Y.H. Liu Award given by AAAR to Walter John



Sheldon K. Friedlander Award given by AAAR to Charles Stanier



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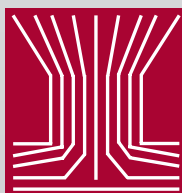
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AAAR staff is here to help with any and all questions you may have on the association, benefits, dues, the annual conference and more. Office hours are Monday - Friday 8:30 AM - 5:00 PM (EST). Phone calls and e-mails are typically answered within 24 hours.

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2007 – 17th International Conference on Nucleation and Atmospheric Aerosols, National University of Ireland, Galway, Ireland

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<http://www.aac2007.org>

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