October 17–21, 2005 · Hilton Austin · Austin, Texas

24TH ANNUAL AAAR CONFERENCE

PRELIMINARY SCHEDULE OF EVENTS

Sunday, October 16

5:00 p.m. – 9:00 p.m.	Registration
8:00 p.m. – 9:00 p.m.	Student Assistant Orientation

Monday, October 17

7:00 a.m. – 8:00 p.m.	Registration
8:00 a.m. – 5:00 p.m.	Tutorial Sessions 1-16
12:00 p.m. – 5:00 p.m.	Exhibitor Set Up
12:00 p.m. – 5:00 p.m.	Poster Set Up
6:00 p.m. – 8:00 p.m.	Exhibits/Poster Sneak Peek and Welcome Reception

Tuesday, October 18

7:00 a.m. – 6:30 p.m.	Registration
8:00 a.m. – 9:15 a.m.	Plenary Session #1 & Awards Ceremony
9:15 a.m. – 11:00 a.m.	Poster Session and Continental Breakfast
9:00 a.m. – 6:30 p.m.	Exhibits/Posters Open
11:00 a.m. – 5:45 p.m.	Platform Sessions
5:50 p.m. – 6:30 p.m.	AAAR Annual Business Meeting

Wednesday, October 19

7:00 a.m. – 5:30 p.m.	Registration
8:00 a.m. – 9:15 a.m.	Plenary Session #2 & Awards Ceremony
9:00 a.m. – 8:00 p.m.	Exhibits/Posters Open
9:30 a.m. – 3:45 p.m.	Platform Sessions
4:00 p.m. – 6:00 p.m.	Working Group Meetings (Staggered)
6:00 p.m. – 8:00 p.m.	Exhibitor Reception

Thursday, October 20

7:00 a.m. – 6:00 p.m.	Registration
8:00 a.m. – 9:00 a.m.	Plenary Session #3 & Awards Ceremony
9:00 a.m. – 3:00 p.m.	Exhibits Open
9:15 a.m. – 11:00 a.m.	Poster Session and Continental Breakfast
9:00 a.m. – 3:00 p.m.	Posters Open
11:00 a.m. – 5:45 p.m.	Platform Sessions
3:00 p.m. – 6:00 p.m.	Exhibitor Move-Out
6:00 p.m. – 8:00 p.m.	Posters Open

Friday, October 21

7:00 a.m. – 2:00 p.m.	Registration
8:00 a.m. – 9:00 a.m.	Plenary Session #4 & Awards Ceremony
8:00 a.m. – 2:00 p.m.	Poster Move-Out
9:30 a.m. – 12:45 p.m.	Platform Sessions

**** Schedule is subject to change. Please check your final program at the conference for exact times and locations.***

The American Association for Aerosol Research
15000 Commerce Parkway, Suite C
Mt. Laurel, NJ 08054

24TH ANNUAL AAAR CONFERENCE

October 17–21, 2005 • Hilton Austin • Austin, Texas

REGISTRATION BROCHURE

Dear Colleagues:

AAAR invites you to participate in its 24th Annual Conference highlighting recent advances in aerosol science and engineering. The first day of the conference, Monday, October 17, will include 16 tutorials covering topics ranging from basic aerosol science to specialized cutting edge tools and techniques. Each following day will begin with a plenary lecture by a distinguished speaker discussing topics of current and emerging interest to aerosol scientists. This year, six specialty symposia will focus on the transport and transformation of atmospheric aerosols, the delivery and biological effects of inhaled particles, the use of space-based aerosol data, the emission of pollutants by aircraft, homeland security issues related to aerosols, and particulate matter pollution problems inside cars and other microenvironments. In addition to the above, the conference will be the forum for more than 700 presentations of exciting research in all aerosol-related areas.

The meeting will be held at the Hilton Austin in Texas. The hotel is located in downtown Austin, four blocks from the waterfront and next to the city's entertainment district. Nearby attractions include the Capitol Building, the Texas Historical Museum, the Lyndon Johnson Presidential Library, and the Congress Avenue Bridge.

The most important aspect of every AAAR conference is your participation in the event. I look forward to seeing you in Austin!

Sincerely,

Spyros Pandis
2005 Conference Chair

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IMPORTANT INFORMATION

PROGRAM INFORMATION

Platform Sessions
A platform session is based on a submitted and approved abstract. Each oral presentation is limited to 15 minutes, including time for questions, and may be accompanied by PowerPoint presentations. No other visual equipment (overhead projectors, slide projectors, etc.) will be provided.

Poster Sessions
Poster Session and Continental Breakfast:
Tuesday, October 18, 2005
9:15 a.m. – 11:00 a.m.

Thursday, October 20, 2005
9:15 a.m. – 11:00 a.m.

The size of a poster cannot exceed 4 foot by 4 foot. The exhibits and posters will be located in the Austin Grand Ballroom located on the Exhibit Level of the Hilton Austin. There are two poster sessions during which authors will present their posters and be available for discussions. All posters will be up for the duration of the conference.

Speaker Ready Room
There is a presentation preview/speaker ready room for presenters located at the Hilton Austin. Please check your final program for available hours and location. We request that you visit the speaker ready room the day prior to your presentation. There will be a technician in the room to assist you with your presentation. Please note: LCD projectors are the only form of visual equipment that will be provided this year. Overhead and slide projectors will not be available.

Late Breaking Posters
Late breaking posters will be accepted on a space available basis until September 12, 2005. Abstracts received after this date will be accepted only if space is available. Call the AAAR office for more information at 856-439-9080.

CM Points
The American Board of Industrial Hygiene will award CM points to CIHs as follows:
.5 point per 1⁄2 day, 4.5 total Industrial Hygiene CM points – approval #: 05-935.

All participants of the AAAR 2005 Annual Conference are encouraged to contact their respective professional certifying agency for the applicability of the AAAR conference program toward additional CM points and CEU credits.

Student Assistant Program
Applications are now being accepted for student assistants for the AAAR 2005 Annual Conference. Student assistants perform a variety of important tasks that ensure the smooth functioning of tutorials, platform and poster sessions, as well as numerous activities.

Student assistants must work a minimum of four (4) sessions. They may attend two tutorials free of charge. All student assistants are required to attend an orientation meeting at the Hilton Austin on Sunday evening, October 16, 2005.

If you are interested in receiving a student assistant application, contact Deanna Bright at the AAAR office at 856-642-4202 or e-mail info@aaar.org, with "student assistant program" in the subject line. You may also access an application from the AAAR Web site at www.AAAR.org. Applications must be received in the AAAR office by August 5, 2005.

Student Travel Grants
There are a limited number of student travel grants available for this conference. More information and an application can be found on the AAAR Web site, www.AAAR.org.

AAAR Annual Business Meeting
This year, the Annual Business Meeting takes place Tuesday, October 18, 5:45 p.m. – 6:30 p.m. This important session provides an overview of the highlights of AAAR today and tomorrow. There will be a special tribute to the current Conference Chair, Spyros Pandis, and his committee, as well as others who have served AAAR during the year. During this meeting, the ceremonial passing of the gavel will mark the transfer of leadership responsibility from Sonia Kreidenweis to incoming president, Anthony Wexler.

Welcome Reception
Monday, October 17, 2005
6:00 p.m. – 8:00 p.m.

This is your opportunity to meet and greet the exhibitors. Representatives from well-known and respected vendors are happy to discuss their product and talk with you about the latest in technology and advances in the field.

Exhibitors' Reception
Wednesday, October 19, 2005
6:00 p.m. – 8:00 p.m.

The Exhibitors' Reception, a AAAR tradition, is a time to visit with the exhibitors and all conference attendees in an informal, relaxed atmosphere.

Award Presentations
Awards will be presented following plenary sessions. Please consult the final program for the specific award presentation times. Join us in honoring the recipients of AAAR's major awards:
Kenneth T. Whitby Award
David Sinclair Award
Sheldon K. Friedlander Award
Benjamin Y.H. Liu Award

ADA Clause
AAAR will use its best efforts to provide reasonable accommodations for attendees with disabilities. Please contact kcalzaretta@ahint.com if you have any special needs.

MEETING LOCATION & ACCOMMODATIONS

Hilton Austin
500 East 4th St.
Austin, Texas 78701
Tel: 512-482-8000
Fax: 512-469 0078
The Hilton Austin is located in downtown Austin, one block from Sixth St. entertainment and within walking distance from the Warehouse Entertainment district. It is also convenient for such attractions as the Capitol Building, Bob Bullock Texas Historical Museum, and the Lyndon B. Johnson Presidential Library.

A block of rooms has been set aside for attendees of the AAAR Annual Conference. Make your reservation directly with the Hilton Austin by calling 512-482-8000. Be sure to mention the AAAR conference to receive the group rate. Reservations must be made by September 16, 2005. After September 16, reservations will be taken on a room and rate availability basis. Room rates for standard single/double occupancy are $150 exclusive of appropriate state (6.75 percent) and local (8.25 percent) taxes. All reservations require one night's deposit and tax in advance, refundable up to 72 hours in advance of your reservation date. All room type accommodations and other special requests may not be available. Should this be the case, the next available room type will be assigned.

GOVERNMENT RATE

A limited number of rooms are available at a government rate on a first-come, first-served basis. Government credentials are required at check-in. Please inform the agent you are with AAAR. For those who qualify, call 512-482-8000.

DO NOT SEND HOTEL REQUESTS TO THE AAAR REGISTRATION OFFICE
This will delay your hotel reservation.

AUSTIN'S POINTS OF INTEREST

This trendy city is home to the University of Texas, the largest public university in the nation. The University of Texas Tower is a perfect place to see all that is Austin! Completed in 1937, the tower is the landmark of the campus, with a newly renovated observation deck, perfect for looking at the beautiful city. Take a tour of the observation deck and see the breathtaking site for yourself. While on campus, visit the Lyndon B. Johnson Library and Museum, with an imitation Oval Office

complete with presidential papers. For historical information, The Bob Bullock Texas State History Museum's fascinating exhibits provide visitors with fascinating facts about the capital city.

The Warehouse District and Sixth Street proves why Austin has been called the "Live Music Capital of the World," with an eclectic variety of music to serenade you every evening. Austin also is known for its ballet, symphony, and opera companies.

Interested in the great outdoors? Austin has plenty of parks, valleys, and lakes – two within the city limits. Take advantage of the sunny skies and enjoy walking, biking, boating, and swimming.

Visit www.AAAR.org for more information about dining, shopping, and a detailed city guide.

SPECIAL MEETING AIR FARE

American Airlines has been designated as the official carrier for the attendees of the AAAR 2005 Conference. American Airlines is offering special rates, which allow you a 5 percent discount off American Airlines published round-trip fares within the continental United States for travel during October 14-24, 2005. Applicable restrictions must be met. Seats are limited.

To take advantage of these rates please call 800-433-1790. Please use the reference file number A09H5AK.

TRANSPORTATION

Austin-Bergstrom Airport
Distance from hotel: 7 miles
Drive Time: 15 minutes

Getting to and from the Austin-Bergstrom Airport:
Limousine – average cost is U.S. $30
Super Shuttle – average cost is U.S. $10
Taxi – average cost is U.S. $20
Bus – average cost is U.S. $0.50

Driving Directions
From the Airport:

Exit airport bearing right on Presidential Blvd. Continue on Cardinal Loop toward airport exit. Turn left on TX 71-East, take the TX 71-West ramp and continue on TX 71-West to US 183-North. Continue on US 183-North to the 1st-5th Streets ramp and continue onto E. Cesar Chavez St., Right onto Trinity St., Right onto E. 5th St., Right onto Neches.

Rental Car

American Airlines group and meeting customers may take advantage of special negotiated rates with Avis Rent-A-Car. Please call toll free at 1-800-433-1790. Reference Code A09H5AK.

Super Shuttle

It is not necessary to make reservations to take the Super Shuttle prior to arrival. Shuttles will be waiting outside of the baggage claim area. There will be a 15-minute wait for your shuttle to arrive. For your return trip, you should contact the front desk to obtain departure times for the Super Shuttle.

REGISTRATION

Instructions

AAAR offers a discounted registration fee if you register by September 17, 2005. Registration forms, including complete payment, must be received by this date to qualify for the early registration discount. Pre-registration ensures timely processing of your registration and helps avoid lengthy on-site lines. The pre-registration fees are considerably lower than on-site due to the increased costs for on-site registration including equipment, staff, and set-up. Please remember both attendees and presenters are required to pay registration fees.

Registration forms received after September 17, 2005, will not be processed. All registrations received after this date will be taken to the meeting and processed as on-site registrants. The on-site registration fee will be applied.

Conference Fees

Conference fees include a one-year membership in AAAR (beginning in 2006). Members receive the AAAR newsletter, *Particulars*, as well as a subscription to the AAAR journal, *Aerosol Science and Technology*.

If you do not wish to be a member of AAAR, please check the appropriate box on the registration form.

Spouse/Guest Registration

Spouses/Guests who are registered for the AAAR Annual Conference will receive admission to the continental breakfasts for the two Poster Sessions and admission to the Welcome and Exhibitors receptions only. The fee for a spouse or guest is $100.

How to Register

Web

Register on the Web through: www.AAAR.org. Payment must be made by credit card. Registrations submitted online are not considered complete until processed. Acknowledgement of receipt of your registration will be available immediately. You will receive a confirmation that your registration has been received and processed via e-mail.

Fax

Please complete the registration form, including name and address information. Credit card payment must be included. Fax registration page to Victoria White, AAAR Registration Manager at 856-439-0525.

Mail

Please complete the registration form, including complete name and address information. Mail the form along with payment via check (U.S. funds), credit card, or wire transfer information to:
Victoria White
AAAR Registration Manager
15000 Commerce Parkway, Suite C
Mt. Laurel, NJ 08054 USA

NO REGISTRATIONS ACCEPTED VIA PHONE.

Student Registration

Full-time students age 18 or older can attend the AAAR 2005 Annual Conference for only $139, if the registration is received by September 17 and accompanied by a copy of a current class schedule (spring or fall) or an official notification from the university indicating full-time enrollment. These documents should be faxed to Victoria White, AAAR Registration Manager, at 856-439-0525. Registration includes 2006 membership.
NOTE: Post-docs are not eligible to register as students.

Payment

Acceptable payment forms include:
Checks made payable to AAAR (drawn on a U.S. bank in U.S. dollars), VISA, MasterCard, and American Express. Wire transfers will be accepted for payment. If paying by wire transfer, please note that you must include an additional $25 to cover all bank fees. In addition, the name of the bank that is sending the transfer must accompany the registration form. Registration forms without accompanying full payment will be returned for completion. Registration will not be processed without payment.

DO NOT SEND HOTEL DEPOSITS WITH REGISTRATION MATERIAL

Confirmation of Registration

Once your completed registration is submitted, a confirmation letter will be e-mailed directly to you. If you do not receive your confirmation by October 8, 2005, contact Victoria White, AAAR Registration Manager at 856-439-9080.

Cancellations/Refunds

To cancel your registration and receive a refund, a written request must be received by September 17, 2005. Cancellation requests received by this date will receive a refund less a $75 processing fee. Requests will be processed after the meeting. All requests received after September 17, 2005 will forfeit 100 percent of monies paid. Registrations and tutorials are non-transferrable.

PLENARY LECTURES

The Conference Committee is proud to have four distinguished speakers for plenary sessions. Each speaker will offer a stimulating and insightful presentation on topics of current and emerging interest to aerosol scientists.

Tuesday, October 18, 2005
8:00 a.m. – 8:45 a.m.

What Satellites Contribute to the Global Aerosol Picture

Ralph Kahn, Jet Propulsion Laboratory/Caltech

Since aerosols generally do not remain in the atmosphere long enough for global mixing, and many respond to changes in relative humidity and other factors, their properties and amounts vary on many space and time scales. However, aerosols contribute to direct radiative forcing, and indirectly by affecting cloud properties, to a degree that must be considered when modeling climate on global, and especially on regional scales. They are also significant players in regional pollution and long-distance material transport.

Compared to in situ measurements, space-borne detectors are relatively blunt instruments for studying atmospheric aerosols. Until recently, only column-averaged aerosol optical depth over dark water, derived from assumed aerosol micro-physical properties, could be retrieved routinely from space. But the enormous range of space and time scales presented by aerosol phenomena of interest creates opportunities for satellites to contribute. Recent advances in spacecraft measuring capabilities, such as those represented by NASA's Earth Observing System MISR and MODIS instruments, are beginning to reliably retrieve particle column amounts over land and water, and to constrain column-average particle size and shape along with spectral optical depth. Polarization, UV, and lidar techniques promise to contribute added sensitivity to particle composition and vertical distribution. Taken together, these new data products are improving our ability to identify and track aerosol air mass types over regional and larger scales, giving added value and context to detailed particle micro-physical properties that can be measured in situ at selected points during the life history of an air mass. This talk will review the strengths and limitations of current space-based aerosol products, and will suggest how they may fit with in situ and surface measurements, to advance our global picture of atmospheric aerosols.

Biography: Ralph Kahn is a principal scientist at NASA's Jet Propulsion Laboratory. He received his PhD in applied physics from Harvard University, concentrating in atmospheric physics and radiative transfer. His research interests include the climate and climate history of Mars and Earth. As a student, he was an experimenter on the Viking Lander Imaging team, and was responsible for imaging the sunset of Mars. Kahn is currently the aerosol scientist for the Multi-angle Imaging SpectroRadiometer (MISR; www-misr.jpl.nasa.gov), which flies aboard the Earth Observing System's Terra satellite. His role in this experiment is to learn as much as possible about dust, smoke, and pollution particles in Earth's atmosphere from MISR's unique observations. Kahn has lectured on global change and atmospheric physics at UCLA and Caltech, and is editor and founder of PUMAS, the online journal of science and math examples for pre-college education (http://pumas.jpl.nasa.gov).

Wednesday, October 19, 2005
8:00 a.m. – 8:45 a.m.

The Health Effects of Ambient Particulate Matter: What We Know in 2005 and Where We Need to Go in the Future

Dan Costa, Environmental Protection Agency

The last decade has seen the accumulation of a large and ever-convincing database that ambient particulate matter can have adverse impacts on health. These impacts range from hospitalization, worsening of pre-existing health impairments, loss of work and school, to mortality. The growing evidence points to certain population subgroups, typically the aged with cardiopulmonary deficiencies, impairments, or genetic predisposition, or children with asthma, are at unusual risk of adverse effect. Life-threatening risk appears to involve cardiac mechanisms not heretofore appreciated as an impact of air pollution. However, what it is about particulate matter that impacts health remains speculative, although there is evidence that certain attributes related to size and combustion origin are involved. PM-associated contaminants such as metal and organic compounds may impart their effects via oxidant mechanisms or distort neural or humoral balances in the body. Linking health effects to the contaminants most associated with specific source or transformation processes may allow for more effective regulatory control. Linking sources to hazardous components to health outcomes remains a challenge to the air pollution science community.

Biography: Dan Costa, ScD, is currently National Program Director for Air Research in the Office of Research & Development/EPA. He is responsible for the Air Research Program across the EPA Labs and Centers. For 18 years prior, he served as chief of the Pulmonary Toxicology Branch of the National Health and Environmental Research Laboratory, where he led an active group investigating the health effects of particulate matter and other air pollutants. He is still personally engaged in some of this work while functioning as director. Dr. Costa earned a BS (1970) in biology at Providence College, RI, a MS (1973) in environmental sciences at Rutgers University, NJ, and a MS (1973) and ScD (1977) in physiology/toxicology at the Harvard School of Public Health under the mentorship of the late Dr. Mary Amdur. He is a diplomat and past-president of the American Board of Toxicology (1994) and is past-president of the Inhalation Specialty Section of the Society of Toxicology (1996). Dr. Costa's personal research interests include the assessment of potential acute and chronic effects of air pollutants on the heart and lung, most recently with focus on mechanisms airway irritant mediation of cardiac dysfunction in compromised animal models.

Thursday, October 20, 2005
8:00 a.m. – 8:45 a.m.

From Ancient Artwork to Modern Functional Aerosol-Made Materials

Sotiris E. Pratsinis, Institute of Process Engineering (IPE), Swiss Federal Institute of Technology

The lecture will start with an overview of aerosol technology from ancient China and Greece to the current manufacture of fumed silica and alumina, pigmentary titania, optical fibers, carbon black and filamentary nickel commodities. Today production rates of these materials can be up to several tons/hour and corresponding reactors resemble best the space shuttle rockets departing from Cape Kennedy. These reactors, however, were built with valiant Edisonian research making difficult reactor operation for flexible synthesis of other promising materials.

Recent major advances in the scientific understanding of aerosol formation and growth allow now optimal aerosol reactor design and inexpensive production of sophisticated nanoparticles with controlled composition, size and morphology leading to exciting new products. For example, noble metal bearing catalysts that were made for eons by multi-step wet impregnation and costly effluent treatment are made now by one-step liquid-fed flame aerosol reactors. Transparent but radioopaque dental nanocomposite materials can be made, for the first time, in these reactors breaking, somehow, the "tyranny" of thermodynamics. These developments bring new challenges to modern aerosol science and engineering. For example, there is a need to distinguish between hard- and soft-agglomerates as the structure of nanomaterials affects their performance as, for example, in a slurry for chemical-mechanical polishing of microelectronics or as a filler in a dental resin. As with every technology that has to survive the "death valley" of scale-up, there is a need for quantitative understanding of the controlling phenomena during interfacing of fluid and particle dynamics for process design that lead to homogeneous multicomponent products of controlled characteristics. Aside from these promising research areas with aerosol-made nanoparticles, there is concern for their health effects. Do the advanced material properties come with adverse health effects? Scattered data imply a rather vague answer. Some are ready to treat this technology as another "GMO" and even impose a moratorium on such research. Clearly, there is a need to place the health effects of aerosol-made nanoparticles on a firm scientific basis to better protect the international investment in this field and guide researchers. Given the current advances in aerosol characterization and the large body of anecdotal data in industry regarding exposure to nanoparticle commodities (carbon black, fumed silica, titania, welding fumes), there is enough knowledge to initiate health effect and, even, epidemiologic research on these materials.

Biography: Sotiris E. Pratsinis has a diploma in chemical engineering from the Aristotle University of Thessaloniki, Greece (1977) and a PhD from the University of California, Los Angeles (1985). He was professor (1985-2000) and interim head (1998) of chemical engineering at the University of Cincinnati, Ohio, USA, until he was elected professor of process engineering at the Swiss Federal Institute of Technology (ETH Zurich) in 1998. There he teaches Mass Transfer, Particle Technology, Nanoscale Engineering and Combustion Synthesis of Materials. His current research focuses on the fundamentals of aerosol synthesis of metal and ceramic nanoparticles and their applications in catalysis, sensors, solar engineering, and nanocomposites. His results are documented in over 200 refereed articles in scientific journals and book chapters while he has received six U.S. and European patents licensed to Dow Chemical, Hosokawa-Micron Degussa, and FlamePowders AG. He is a recipient of the 1988 Kenneth T. Whitby Award of AAAR and the 1995 Marian Smoluchowski Award of the Gesellschaft für Aerosolforschung (GAeF).

Friday, October 21, 2005
8:00 a.m. – 8:45 a.m.

What Are We Learning From Field Measurements with Aerosol Mass Spectrometry?

Dr. Jose-Luis Jimenez
Department of Chemistry & Biochemistry and Cooperative Institute for Research in the Environmental Sciences (CIRES), University of Colorado-Boulder

The past decade has seen the emergence of several methods capable of determining the size and chemical composition of aerosol particles in real-time using mass spectrometry, allowing the investigation of aerosol sources, processes, and effects in more detail than was possible before. The Aerodyne Aerosol Mass Spectrometer (AMS) is currently the most widely used instrument of this type. This presentation explores recent applications of the AMS and complementary instrumentation to the analysis of ambient particles at multiple urban, rural, and remote locations. Urban locations include Pittsburgh, Mexico City, New York City, Riverside (California), and Manchester (UK). Rural and remote locations include Storm Peak (Colorado), Jungfraujoch (Switzerland), Trinidad Head (California), Jeju Island (Korea), Okinawa (Japan), and Mace Head (Ireland). Examples include the determination of the composition of growing particles during nucleation events; the characterization of the organic aerosol components based on the entire organic mass, rather than on tracers; and the integration of AMS data with other measurements towards closure of aerosol effects on light scattering and cloud nucleation. The presentation will conclude by summarizing recent improvements to the AMS: high m/z resolution, soft ionization, and light scattering and surrogate morphology measurements.

Biography: Dr. Jose-Luis Jimenez received a double MS in mechanical engineering from the Universities of Zaragoza (Spain) and Compiegne (France) in 1993; and a PhD also in mechanical engineering from MIT in 1998. From 1999 to mid-2002, he was a research scientist, first at Aerodyne Research and MIT, and later at Caltech. He has been heavily involved in the development of the Aerodyne Aerosol Mass Spectrometer (AMS), and led the first field deployment (Atlanta Supersite) and the first aircraft deployment (ACE-Asia) of this instrument, among many other field campaigns. In August 2002, he joined the faculty of the Department of Chemistry and CIRES at the University of Colorado-Boulder. His current research interests center on instrument development for organic aerosols and particle shape measurement, and on ground and aircraft field studies of aerosol sources, processes, and effects. He is a co-author on 35 journal papers on aerosol mass spectrometry and its applications.

AAAR TUTORIALS MONDAY, OCTOBER 17, 2005

FIRST SESSION: 8:00 a.m. – 9:40 a.m.

1. Intro to Aerosol Mechanics I
Dr. William C. Hinds, UCLA School of Public Health, Center for Occupational and Environmental Health, Department of Environmental Health Science, Los Angeles, CA

Abstract: These two courses form a sequence that covers basic aerosol mechanics (particle motion) at an introductory level. Topics include: stokes law, settling velocity, slip correction, aerodynamic diameter, non-spherical particles, acceleration, relaxation time, stopping distance, impaction, isokinetic sampling, diffusion, and coagulation. The course covers theory and applications and is suitable for those new to the field and for others who want to brush up on the basics.

William Hinds is a professor of environmental health sciences at the UCLA School of Public Health. He received a bachelor's degree in mechanical engineering from Cornell University and a doctorate in environmental health from Harvard University.

2. Nucleation of Particles from the Gas Phase
Dr. Steven L. Girshick, Professor and Director of Graduate Studies, Department of Mechanical Engineering, and member of Graduate Faculty, Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN

Abstract: Nucleation, which represents the birth of aerosol particles from gas-phase precursors, is of ubiquitous importance yet remains one of the great unsolved problems of science—unsolved, in that it is still not possible, with reasonable quantitative accuracy, to predict nucleation rates for most substances, even in the simplest scenarios. This seminar will present an overview of our understanding of nucleation from the gas phase. Various contexts will be considered, ranging from self-nucleation via condensation of a supersaturated vapor, to ion-induced nucleation, to nucleation of chemically bound clusters in reacting gases and plasmas.

Professor Steven L. Girshick has been on the faculty at the University of Minnesota since 1985. He received his SB degree in humanities and science at MIT and his MS and PhD degrees in mechanical engineering at Stanford University. He served as president of the International Plasma Chemistry Society from 2000-2003, and was recently appointed editor of *Plasma Chemistry and Plasma Processing*, effective 2006.

3. Health Effects Associated with Exposure to Particulate Matter
Dr. Robert Devlin, Human Studies Division, Office of Research and Development, US Environmental Protection Agency, RTP, NC

Abstract: The World Health Organization estimates that exposure to air pollution particles results in 500,000 premature deaths each year. These numbers are primarily based on epidemiology studies that report associations between daily fluctuations in PM levels and mortality from cardiopulmonary causes. However, when these studies were published very little was known about which PM components might be responsible for the adverse health effects or whether PM emitted from different sources had different toxicity. There was almost no information about the biological mechanisms that could explain why a person could die within hours after inhaling very low levels of PM. Nor was it well understood which people might be particularly at risk. This course will present the latest research, which addresses these three topics. It is suitable for those seeking a primer on health effects associated with exposure to PM.

Robert Devlin is chief of the Clinical Research Branch in the Human Studies Division, U.S. EPA. He received his PhD at the University of Virginia and was a faculty member at Emory University before joining the EPA. He has studied the health effects of air pollution in humans for 20 years.

4. Secondary Aerosol Formation
Dr. Paul J. Ziemann, Air Pollution Research Center and Department of Environmental Sciences, University of California, Riverside, CA

Abstract: Secondary aerosol is an important component of atmospheric fine particles that generally consists of organics, sulfates, and nitrates. The processes that lead to the formation of this material are often complex, and can involve gas and particle phase chemistry, nucleation, and gas-particle partitioning. This course will cover the major chemical reactions and partitioning processes involved in the formation of secondary organic and inorganic aerosol (with a strong emphasis on organic aerosol) using examples from laboratory and field studies.

Paul Ziemann is an associate professor of atmospheric chemistry at the University of California, Riverside. He received a doctorate in chemistry from Penn State University and was a postdoctoral researcher in the Particle Technology Laboratory at the University of Minnesota.

SECOND SESSION: 10:00 a.m. – 11:40 a.m.

5. Intro to Aerosol Mechanics II
Dr. William C. Hinds, UCLA School of Public Health, Center for Occupational and Environmental Health, Department of Environmental Health Science, Los Angeles, CA

Abstract: These two courses form a sequence that covers basic aerosol mechanics (particle motion) at an introductory level. Topics include: stokes law, settling velocity, slip correction, aerodynamic diameter, non-spherical particles, acceleration, relaxation time, stopping distance, impaction, isokinetic sampling, diffusion, and coagulation. The course covers theory and applications and is suitable for those new to the field and for others who want to brush up on the basics.

William Hinds is a professor of environmental health sciences at the UCLA School of Public Health. He received a bachelor's degree in mechanical engineering from Cornell University and a doctorate in environmental health from Harvard University.

6. Aerosols and Clouds: Can We Quantify the Effect of Aerosols on Climate Change?
Dr. Joyce E. Penner, University of Michigan, Ann Arbor, MI

Abstract: Atmospheric aerosol particles serve as nuclei for cloud droplet and ice particle formation, affecting the number concentration of cloud particles and thereby influencing cloud reflectance and absorption as well as precipitation formation. The magnitude of the effect of aerosols on clouds depends on their chemical properties as well as their size distribution. The influences of anthropogenic

aerosols through cloud processes on the Earth's radiation budget may be substantial, but the radiative forcing of climate change by anthropogenic aerosols is considered the most uncertain component of the forced climate change over time since 1750. This tutorial presents an overview of these phenomena and identifies the aerosol properties that must be known to quantify their influences on clouds.

Professor Joyce E. Penner is a professor of atmospheric, oceanic, and space sciences at the University of Michigan. Her research has focused on the effects of aerosols on climate, using large-scale models to quantify these effects. She was a coordinating lead author for the 2001 Intergovernmental Panel on Climate Change report on Aerosols, their Direct and Indirect Effects. She received her PhD in applied mathematics from Harvard University.

7. Introduction to Aerosol Technology for Pulmonary Drug Delivery
Dr.-Ing. Reinhard Vehring, Nektar Therapeutics, San Carlos, CA

Abstract: In the last decade, significant advances have been made in the area of pharmaceutical aerosols for drug delivery. For instance, the development of systemic drug delivery with inhalable insulin shows great promise. This course provides an overview of the technology behind the emerging new class of therapeutics that makes such advances possible. It introduces concepts of delivery, deposition, and the requirements that aerosols need to fulfill to meet product targets. The tutorial covers various approaches to formulation, manufacture, and dispersion of pharmaceutical aerosols across the industry. Special emphasis is put on the improvements in dispersibility and physical stability that were achieved via implementation of particle engineering methods in the drug development process.

Dr.-Ing. Reinhard Vehring is a staff scientist at Nektar Therapeutics. He is responsible for early product design and development of therapeutics for pulmonary drug delivery. He received a diploma in mechanical engineering from the Gerhard Mercator University in Duisburg and a doctorate from the University of Bochum, Germany. He has been active in aerosol research for more than 14 years.

8. Ambient PM2.5 Measurement and Characterization
Dr. Jay R. Turner, Chemical Engineering Department and Environmental Engineering Program, Washington University, St. Louis, MO

Abstract: Data quality objectives are inherently linked to the intended use of the data (e.g., compliance monitoring, health studies, source apportionment studies) and these objectives guide the measurement strategy. This course will provide an overview of measurement methods to characterize the mass concentration and chemical composition of ambient fine particulate matter within the context of data quality objectives. Substrate and semicontinuous methods will be discussed with emphasis on commercially-available instruments and analytical services to characterize PM2.5 mass and its major chemical components (sulfate, nitrate, carbon). Advantages and disadvantages of the various methods will be highlighted. This course is suitable for those seeking a primer on PM2.5 measurement strategies and hardware.

Jay Turner is an associate professor at Washington University in St. Louis. His research interests include measurement methods and field studies to characterize ambient particulate matter and air toxics. He is the principal investigator for the St. Louis – Midwest Supersite. Turner received bachelor's and master's degrees in chemical engineering from UCLA and a doctorate in chemical engineering from Washington University in St. Louis.

THIRD SESSION: 1:00 p.m. – 2:40 p.m.

9. Introduction to Source-Oriented Aerosol Modeling
Dr. Michael J. Kleeman, Department of Civil and Environmental Engineering, University of California at Davis, Davis, CA

Abstract: This course will cover the basics of source-oriented aerosol modeling where particles from different sources are tracked separately through an atmospheric simulation. Topics include: review of aerosol representation in models, motivation for externally mixed models, size and composition profiles for different sources, aerosol transformation processes, validation of externally mixed aerosol predictions, applications of externally mixed aerosol predictions, and handling the increased computational burden via parallel processing. The course will cover fundamental theory and provide examples of applications where possible. Some aspects of this field are still active research areas, so the class is suitable for anyone who is interested in the general topic.

Michael Kleeman is a professor of civil and environmental engineering at University of California, Davis. He received a bachelor's degree in mechanical engineering from the University of Waterloo, and a PhD in environmental engineering science from the California Institute of Technology.

10. Nanoparticle Measurements
Dr. Richard C. Flagan, Chemical Engineering and Environmental Science and Engineering, California Institute of Technology, Pasadena, CA

Abstract: Aerosol nanoparticle measurements are needed both to support developing nanotechnologies and to facilitate quantification of the health consequences of such particles. Nanoparticles pose a number of measurement challenges that have stimulated a number of recent developments. This tutorial will examine the advances that have extended routine mobility analysis to the low nanometer, and even subnanometer size regimes, improved size resolution well beyond that of traditional differential mobility analyzers, and enabled the fast measurements that are needed to resolve the dynamics of rapidly changing nanoparticle concentrations. Many of these techniques involve redesign of instruments to optimize their performance in the nanoparticle regime, although a number of radical new designs have emerged in recent years. The tutorial will explore ways for rational comparison of the capabilities and limitations of the different methods.

Richard Flagan is the McCollum/Corcoran Professor and executive officer of chemical engineering and professor of at the California Institute of Technology. He is also editor-in-chief of *Aerosol Science and Technology*. His research spans a wide range of aerosol science, ranging from its application to the development of aerosol nanoparticle-based microelectronic devices to atmospheric aerosols. He has developed numerous aerosol instruments that have been used to probe aerosol nanoparticles including transonic low pressure impactors, the radial differential mobility analyzer, the scanning mobility particle sizer, fast response condensation particle counters, and the opposed migration aerosol classifier.

AAAR TUTORIALS (CONTINUED)

11. Assessing Bioaerosol Exposures and Their Impacts
Dr. Janet M. Macher, Environmental Health Laboratory, California Department of Health Services, Richmond, CA

Abstract: Particles of biological origin comprise variable fractions of particulate matter in the ambient and indoor environments. Measurement of baseline concentrations is fundamental in aerobiological investigations to evaluate the effects of bioaerosols on humans, other animals, plants, and the environment. The challenges faced in representative measurement of biological agents will be discussed with examples from studies of their roles in the development of the immune system and allergic diseases, recognition of microbial contamination in buildings, ambient monitoring of pollen and spores with impacts on human health and agriculture, and determination of the infectious doses of respiratory pathogens.

Janet Macher is a researcher with the Division of Occupational and Environmental Disease Control where she evaluates methods to collect and identify airborne biological material, studies engineering measures to control airborne infectious and hypersensitivity diseases, and participates in investigations of bioaerosol-related illnesses. Dr. Macher has a master's degree from the University of California and doctorate from Harvard University with emphasis on environmental health, public health, and microbiology.

12. Photochemistry of Atmospheric Particles and Aqueous Drops
Dr. Cort Anastasio, Associate Professor, Atmospheric Science Program, Department of Land, Air & Water Resources, University of California at Davis, Davis, CA

Abstract: Sunlight, directly and indirectly, drives most of the chemistry in the atmosphere. While photochemistry in the gas phase has been studied for decades, the photochemistry of atmospheric condensed phases is a relatively new field. This tutorial will give an overview of the rich variety of photochemical processes that are known to occur in atmospheric particles, liquid fog and cloud drops, and frozen ice particles and snow. We will begin by discussing the fundamentals of photochemistry in condensed phases and the photochemical reactions of specific compounds such as nitrate, nitrite, iron, and several organic compounds. In the second half, we will examine the formation of oxidants, and simultaneous transformations of reduced nitrogen, carbon, and sulfur compounds, in illuminated tropospheric particles and aqueous drops.

Dr. Anastasio received his bachelor's degree in chemistry from Brown University and his doctorate in environmental chemistry from Duke University. In 1995-1996, he was a postdoctoral fellow in the Department of Chemistry and the Centre for Atmospheric Chemistry at York University in Toronto. He has been at the University of California at Davis since 1996. His research focuses on the chemistry and photochemistry of fog and cloud drops, atmospheric particles, snow, and ice.

FOURTH SESSION: 3:00 p.m. – 4:40 p.m.

13. How to Make Advanced Factor Analysis Models Work for You
Philip K. Hopke, Center for Air Resources Engineering and Science, Clarkson University, Potsdam, NY

Abstract: Over the past decade, two advanced factor analysis models, Unmix and Postive Matrix Factorization (PMF) have been developed and applied to air quality data. PMF has been more widely used and has a number of attractive features. The U.S. Environmental Protection Agency will be releasing a version of PMF in the summer of 2005 that can be freely downloaded and used. It will have a more user-friendly interface and a better error estimations scheme. At the same time, version 3 of Unmix will be released. This tutorial will begin with a general introduction to receptor modeling. It will lift the lid on these black boxes and provide an introduction to how they work and how they can be utilized to analyze particulate composition data for source identification and apportionment. It will also introduce auxiliary analyses such as conditional probability function analysis that can be used to help identify the likely sources contributing to the particle samples.

Dr. Philip K. Hopke is the Bayard D. Clarkson Distinguished Professor at Clarkson University and the director of the Center for Air Resources Engineering and Science. He has served as a member of the Clean Air Scientific Advisory Committee (CASAC) and is the outgoing chair of the CASAC. He also chairs the CASAC Ambient Air Monitoring and Methods (AAMM) Subcommittee. In addition, he serves as a Science Advisory Board (SAB) member. Professor Hopke is the immediate past-president of the American Association for Aerosol Research, and was a member of the National Research Council's Congressionally-mandated Committee on Research Priorities for Airborne Particulate Matter and the Committee on Air Quality Management in the United States. Professor Hopke received his BS in chemistry from Trinity College (Hartford) and his MA and PhD degrees in chemistry from Princeton University. After a post-doctoral appointment at M.I.T., he spent four years as an assistant professor at the State University College at Fredonia, NY. Dr. Hopke then joined the University of Illinois at Urbana-Champaign, and subsequently came to Clarkson in 1989 as the Robert A. Plane Professor with a principal appointment in the department of chemistry. He has served as dean of the Graduate School, chair of the Department of Chemistry, and head of the Division of Chemical and Physical Sciences before he moved his principal appointment to the Department of Chemical Engineering in 2000. In 2002, he became the Bayard D. Clarkson Distinguished Professor and director of the Center for Air Resources Engineering and Science. He has published over 310 peer-reviewed journal articles, written one book and edited five others and has been developing and applying receptor models for more than 30 years.

14. Light Scattering by Particles: An Intuitive Description for Aerosol Scientists
Dr. Chris Sorensen, Department of Physics, Kansas State University, Manhattan, KS

Abstract: This tutorial will describe simple and intuitive approaches for understanding and applying light scattering to aerosol and colloidal systems. Particulate systems will include spheres, aggregates, and nonspherical particles. With this foundation, there will be discussion regarding experimental methods for scattering and some instruments available in the marketplace. This tutorial will also cover light scattering problems relevant to current aerosol science.

Chris Sorensen is University Distinguished Professor of Physics and Chemistry at Kansas State University where he has won numerous teaching awards. He is also the recipient of the AAAR Sinclair Award. He has presented a tutorial on light scattering at the AAAR annual meeting numerous times in the past and enjoys doing so.

15. Biological Aerosol Measurement and Detection

Dr. Jim Ho, Defence Scientist, Biological Detection Section, Defence Research and Development Canada Suffield, National Defence Canada, Medicine Hat, Alberta, Canada

Abstract: Recent global events have heightened public awareness in the need to detect potential biological threats. Consequently, biological aerosol detection in real time has become a civilian urgency whilst for the military, this has been an on-going requirement. Fortunately, much of the experience gained from satisfying the latter can be of benefit to most situations. Biological aerosol lessons learned have been successfully applied to environmental monitoring as well as to biological threat measurements. This overview will summarize work done over the past 20 years, applying cumulative experience that has helped in deriving a biological detection concept. I will describe recent developments towards building a detection system to operate continuously, 24 hours a day and seven days a week with minimal maintenance and few false alarms and without continuous consumption of expensive biochemical reagents. This overview will further discuss practical aspects of measuring biological aerosols where the results must be compared to reference samplers that provide culturable or "live" data.

Dr. Ho received his bachelor's and master's degrees in microbiology from McGill University and his doctorate in microbial biochemistry from the University of Kentucky in Lexington. He has been at DRDC Suffield since the early 1980s working on biological detection. His detection technology was deployed in the gulf during the Gulf War. In the mid-1990s he developed the optical sensing technology that measures "live" particles in air, the Fluorescence Aerodynamic Particle Sizer (FLAPS). It is now a commercial off the shelf instrument adopted by numerous countries around the world.

16. Particle Mass Spectrometry

Murray Johnston, Department of Chemistry and Biochemistry, University of Delaware, Newark, DE

Abstract: For over a decade, mass spectrometry has been used to determine the chemical composition of airborne particles in real-time, often with concurrent size selection or measurement. This tutorial will provide an overview of methodology and applications of particle mass spectrometry, emphasizing the complementary aspects of single-particle and bulk composition measurements with these instruments. The entire process will be covered from aerosol sampling, to the acquisition of "raw" data, to the extraction of meaningful information from the data. Applications of this methodology to both ambient aerosol characterization and laboratory aerosol reaction kinetics will be discussed.

Murray Johnston began his academic career as assistant/associate professor of chemistry and fellow of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado, Boulder. He subsequently moved to the University of Delaware where he is currently professor of chemistry. His research involves the development of particle mass spectrometers and their application to aerosol reaction kinetics and field measurements. Current instrumentation in his laboratory includes two single particle mass spectrometers for characterizing fine and ultrafine particles, a photoionization aerosol mass spectrometer for characterizing organic components in particles, and a nanoparticle mass spectrometer.

SPECIAL SYMPOSIA

Aerosols In-Cabin and in Other Micro-Environments
Organized by: Antonio Miguel

The purpose of this symposium is to present results from a wide variety of studies that characterize personal exposure in fixed spaces that have relatively homogenous air pollution concentrations. Such spaces include on-road and in-cabin measurements in private automobiles, school buses, and public transportation vehicles during daily commutes, as well as in airborne aircraft during long-range commercial flights, in-space shuttles, indoors in homes, public buildings, underground metros and other micro-environments. The symposium is intended to be a forum for all researchers working in the fields of chemical, physical, optical, and dynamic aerosol properties.

Aviation Emissions – APEX and Related Studies
Organized by: Chowen C. Wey, Philip D. Whitefield, and Andreas Petzold

The objective of this special symposium is to address current exciting research topics related to aircraft particulate matter and gaseous emissions. It consists of four sessions. Sessions will be dedicated to present the methods and comprehensive database established from the recent Aircraft Particle Emissions eXperiment (APEX) project. APEX measurement team includes researchers from NASA, EPA, DoD, University of Missouri-Rolla, and Aerodyne Research using state-of-the-art measurement systems yielding both gaseous and PM characterization data obtained from a NASA DC-8 airplane with CFM56-2C1 engines. A session will focus on the latest European studies on the interaction of combustion particles and the atmospheric water vapor.

Combining Multiple Data Sources and Models to Create an Accurate, Global-Scale Aerosol Picture
Organized by: Ralph Kahn, Sonia Kreidenweis, and John Seinfeld
Sponsored by: NASA

New aerosol products from NASA's Earth Observing System satellite instruments are reaching maturity. For global, space-based observations, they contain unprecedented aerosol column spectral optical depth accuracy and detail about particle micro-physical properties. The time seems right to bring these data to bear on the work of more AAAR scientists. This symposium is aimed at introducing the AAAR community to the latest space-based aerosol data, discussing current ideas about combining satellite observations with far-more-detailed but less extensive in situ and surface data, and stimulating greater collaboration between NASA aerosol scientists and those in the traditional AAAR community. The afternoon event will feature invited and contributed talks, a panel discussion, and an interactive poster session.

International Consortium for Atmospheric Research on Transport and Transformation (ICARTT) Study
Organized by: Ann Middlebrook and Robert Griffin
Sponsored by: University of New Hampshire, NOAA

During the summer of 2004, the International Consortium for Atmospheric Research on Transport and Transformation aimed to characterize the air quality in the northeastern United States as well as in upwind and downwind locations. A significant fraction of this campaign was dedicated to the characterization of aerosols using both measurements and modeling tools. This special symposium on particulate matter related to this campaign welcomes presentations related to any aspect of atmospheric aerosol research (chemical measurements, physical measurements, dynamics, data analysis, comparison to data from earlier missions, modeling studies, etc.).

Joint AAAR-ISAM Symposium Delivery and Biological Effects of Inhaled Particles
Organized by: Ron Wolff and Warren Finlay
Sponsored by: Aradigm, ISAM

This symposium will provide cutting-edge discussion of the latest developments related to respiratory tract delivery of pharmaceutical aerosols, ultrafine aerosols, and nanoparticles. A particular focus will be local effects in the lung (i.e, new approaches to treatments for respiratory disease), and ways to assess and optimize delivery. Impact of particle engineering, morphology, and type, on dose, local deposition and effects will also be explored. The symposium includes four sessions: 1) Disposition and Biological Effects 2) Experimental Approaches 3) Medical Aerosols and 4) Modeling and Simulation. Confirmed invited speakers include Bill Bennett, Gerry Smaldone and Werner Hoffman.

AAAR AWARDS PROGRAM AND SPONSORSHIP INFORMATION

AWARDS PROGRAM

The prestigious AAAR Awards Program offers support and recognition to individuals who have shown outstanding achievement in aerosol science and technology.

As part of a five-year initiative, AAAR will focus on one award per year to raise awareness and encourage contributions. This year the **Sheldon K. Friedlander Award** is featured. This award is presented to a young scientist in recognition of an outstanding thesis.

The Friedlander Award will be highlighted during the conference at a booth in the exhibit area. In addition, for each contribution made to this award in 2005, AAAR will match it up to $1,000. We strongly encourage you to make a contribution!

Other awards presented annually by AAAR:

Kenneth T. Whitby Award – Awarded to a young scientist in recognition of outstanding contributions to aerosol science and technology. The recipient must have completed his/her highest degree within the last 10 years.

David Sinclair Award - Awarded to a senior scientist still active in his/her career and recognizes sustained excellence in aerosol research and technology. The recipient must have received his/her highest degree in 1995 or earlier.

Benjamin Y.H. Liu Award – Awarded to an aerosol scientist for outstanding contributions to aerosol instrumentation and experimental techniques that have significantly advanced the science and technology of aerosols.

Thomas T. Mercer Joint Prize – Awarded to an aerosol scientist for outstanding contributions in the field of aerosols in medicine; awarded jointly by AAAR and the International Society of Aerosols in Medicine (ISAM).

If you are interested in contributing to the Friedlander Award or one of the others, please complete the information on the registration form or visit www.AAAR.org to make a donation online.

SPONSORSHIP

Introducing New Opportunities for 2005 AAAR Annual Conference Sponsorship and Advertising

AAAR offers opportunities to promote and demonstrate commitment to the science of aerosol research by becoming a sponsor of the annual conference. Companies not interested in being a sponsor of the conference can provide support through advertising in the final program and/or abstract book.

For information on specific sponsorship opportunities or advertising, please contact Deanna Bright at 856-642-4202, e-mail info@aaar.org or visit the Web site www.AAAR.org.

The American Association for Aerosol Research

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October 17–21, 2005 · Hilton Austin · Austin, Texas
Pre-registration Deadline: September 17, 2005

24TH ANNUAL AAAR CONFERENCE

1

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If yes, please provide full name: _____

2005 increases are limited to an increase of the CPI, rounded to the nearest dollar.

2 REGISTRATION FEES (excludes Tutorial fees listed below) **Circle ONE selection**

	Early Bird (Rec'd on or before August 10)	Advance (Rec'd between August 11 and September 17)	On-site (Rec'd after September 17)
Regular*	**$584**	**$662**	**$743**
Student**	**$139**	**$139**	**$218**
Retiree***	**$139**	**$139**	**$218**

❑ I do not wish to be a 2006 AAAR member (conference fee remains as listed)

* Regular registration fees include 2006 membership dues and subscription to AS&T

** Student registration fees include 2006 membership dues – NOT AS&T. Form must include a copy of university enrollment or class schedule.

*** Retiree registration fees include 2006 membership dues – NOT AS&T.

3 TUTORIAL FEES/MONDAY, SEPTEMBER 17, 2005

Early Bird (on or before August 10) • Advance (Rec'd between August 11 and September 17) • On-site Registration - (Rec'd after September 17)

ONE TUTORIAL	Early	Adv.	On-site
Regular	$122	$138	$155
Student/Retiree	$74	$79	$96
Org Mem	$96	$106	$122

TWO TUTORIALS	Early	Adv.	On-site
Regular	$203	$233	$251
Student/Retiree	$117	$127	$144
Org Mem	$160	$180	$198

THREE TUTORIALS	Early	Adv.	On-site
Regular	$261	$309	$325
Student/Retiree	$149	$165	$180
Org Mem	$213	$245	$261

FOUR TUTORIALS	Early	Adv.	On-site
Regular	$298	$363	$378
Student/Retiree	$170	$191	$208
Org Mem	$256	$298	$314

Org member tutorial rates are only available to employees of Duke Scientific Corp, MSP Corp, Rupprecht & Patashnick CO, Inc., TSI Inc., Sunset Laboratory, and Particle Instruments, LLC.

Please check only one per time period

8:00 a.m. to 9:40 a.m.
- ❑ 1. Introduction to Aerosol Mechanics I
- ❑ 2. Nucleation of Particles from the Gas Phase
- ❑ 3. Health Effects Associated with Exposure to Particulate Matter
- ❑ 4. Secondary Aerosol Formation

10:00 a.m. to 11:40 a.m.
- ❑ 5. Introduction to Aerosol Mechanics II
- ❑ 6. Aerosols and Clouds: Can We Quantify the Effect of Aerosols on Climate Change?
- ❑ 7. Introduction to Aerosol Technology for Pulmonary Drug Delivery
- ❑ 8. Ambient $PM_{2.5}$ Measurement and Characterization

1:00 p.m. to 2:40 p.m.
- ❑ 9. Introduction to Source-Oriented Aerosol Modeling
- ❑ 10. Nanoparticle Measurements
- ❑ 11. Assessing Bioaerosol Exposures and Their Impacts
- ❑ 12. Photochemistry of Atmospheric Particles and Aqueous Drops

3:00 p.m. to 4:40 p.m.
- ❑ 13. How to Make Advanced Factor Analysis Models Work for You
- ❑ 14. Light Scattering by Particles: An Intuitive Description for Aerosol Scientists
- ❑ 15. Biological Aerosol Measurement and Detection
- ❑ 16. Particle Mass Spectrometry

4 AWARD DONATION (OPTIONAL)

Please circle the award to which you would like your donation to be allocated:

Liu Whitby Sinclair Mercer Friedlander

Please refer to the descriptions on the previous page or visit www.AAAR.org

REFUND POLICY

Requests for refunds must be submitted by September 17. There will be $75 processing fee for all refunds. Refunds will not be processed until after the meeting. Refund requests received after September 17 will not be honored. Registrations and tutorials are non-transferable.

HOW TO SUBMIT

Mail or fax this form to:

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5 PAYMENT INFORMATION

Make checks payable to AAAR (U.S. funds drawn on U.S. bank only).
(NOTE: Award contributions will be charged separately if paid by credit card.)

❑ CHECK ❑ WIRE TRANSFER (Requires additional $25 to cover bank fees)
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6 TOTAL

Registration Fee: $_____
Tutorial Fee: $_____
Spouse/Guest Fee: $_____
Total Conference Fee: $_____
Award Donation: $_____