PARTICULARS

The E-Newsletter of the American Association for Aerosol Research

SPRING 2020

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As always, we'd love any feedback or suggestions you may have for ***Particulars***

Simply email **info@aaar.org** with the subject line ***'Particulars'***

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President's Message

Dear AAAR Members,

I expect that we are all focused on the Coronavirus (SARS-COV-2) and COVID-19 outbreak and how to protect ourselves and our communities. It is encouraging to see our members heavily involved in the discovery and scientific dialogue surrounding aerosol transmission of the virus. Thank you! In addition, the AAAR leadership is monitoring the situation closely and its potential impact on our society and the conference. We all hope that the threat will have subsided by October, but we will follow the WHO and CDC recommendations in making decisions regarding the meeting. For now, we will proceed with our conference preparations and form a contingency plan. We are lucky that our association management company, Virtual Inc., is a leader in hosting online conferences, if we find that we need that resource. Please feel free to contact me or the AAAR business office with any AAAR concerns.

Now for some good news. We have big announcements in this issue of *Particulars*. Namely, we have a new award for a mid-career scientist, we approved a 5-year Strategic Plan (2020-2025), and we welcomed a new AAAR Executive Director and Executive Sponsor. Also, the Conference Chair **Matti Maricq** and the Conference Committee have been hard at work planning another excellent meeting for October. I hope that you have your AAAR 2020 **abstracts** underway and are ready to submit by the **May 1 deadline**! Please read on for more details on the announcements and upcoming conference.

We are very excited to introduce the **AAAR Susanne Hering Award!** The AAAR Susanne Hering Award recognizes outstanding contributions to aerosol science by a mid-career scientist whose work has had significant impact on public health, the built environment, or the global ecosystem. The award was developed by the Awards Committee and approved unanimously by the AAAR Board of Directors in February 2020. Dr. Hering is the Founder and President of Aerosol Dynamics Inc. (Berkeley, CA). She has been instrumental in building AAAR into a vibrant, sustainable community for aerosol scientists, serving as President, Conference Chair, Board Member, Plenary Speaker and Tutorial Speaker multiple times since the early 1980's. Fundraising for building the AAAR Susanne Hering Award endowment will kick off soon. If you are interested in donating to this award, please visit the donate page **https://www.aaar.org/donations/** or contact the AAAR main office **(info@aaar.org; 703.234.4087)**. We hope to present the AAAR Susanne Hering Award to the first recipient at the 2021 AAAR Annual Meeting in Albuquerque, NM.

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Our **new 5-year Strategic Plan (2020-2025)** is now finalized. The four pillars of the strategic plan are **Engagement**, **Innovation**, **Education**, and **Integrity**. The plan includes our activities, membership goals, and financial goals. A copy of the strategic plan is available on the members section of the AAAR website "My AAAR". A new **Code of Conduct** has also been approved, which can be found on the "About AAAR" tab on the website.

We would also like to welcome **new members of the AAAR management team**, **John Lessard**, our new Executive Director, and **Jim Cudahy**, our new Executive Sponsor. John and Jim both work for Virtual Inc., the association management company that has been working with us for the past several years. They both come to us with deep experience and the desire to keep our organization strong into the future. Please see their bio-sketches in this issue of *Particulars*.

I'd like to take this opportunity to thank our previous AAAR Executive Director **Bill Carney** and AAAR Program Director **Homaira Sheikh** for helping to keep us on track and successful for the past five years. Many of us have worked closely with Bill and Homaira, and we wish them the best in their new positions. I pass along these words from Bill Carney:

> "I wanted to reach out to my good friends at AAAR to thank you for the wonderful support you have provided me and the confidence you have shown in me these past five years as I served as your executive director. I think it might please you to know that in my 40+-year career in the association management business, I have never seen a better organized, volunteer-driven membership society. You should be proud of the association you have built and how beautifully prepared you are each year to pass the leadership on to fresh hands… Thank you so much for everything. It has been my distinct pleasure to have served you."

Looking ahead, the **38th Annual AAAR Conference** will be held in **Raleigh, NC October 5-9, 2020**. In addition to the regular schedule of plenary, platform and poster presentations, tutorials, and exhibits, several of the conference initiatives that were launched at the 2019 conference will continue, including "Meet the Job Seekers" poster session, the aerosol art and video competition, and enhanced travel support for aerosol professionals coming from the Americas outside the United States. More information on the conference, including these initiatives, can be found on the conference website.

I hope to see you all in Raleigh! ●

Andrea R. Ferro
AAAR President

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Leadership Team Transition

Meet John Lessard and Jim Cudahy

John Lessard is a Director of Client Services at Virtual, Inc. John will serve as the Client Lead and Executive Director to AAAR, working with its Board and Membership to fulfill its mission. Prior to joining Virtual in August of 2019, John successfully ran his own small business in the retail gifting industry for 18 years. Interestingly enough, before venturing off on his own and fulfilling his entrepreneurial calling, John worked at Virtual! Suffice it to say, he has come full circle and returned home. John looks forward to partnering with AAAR and further strengthening its reputation in the field of Aerosol Research.

Jim Cudahy is a senior consultant at Virtual, Inc. with more than 30 years of experience in association management, including as CEO of the National Court Reporters Association and the National Investor Relations Institute. Jim will serve as a strategic advisor to AAAR, helping to align the organization's scope of services within Virtual to its strategic objectives. It is Jim's hope to play a key role in helping to further develop AAAR's value proposition and explore new ways to serve our constituency. ●

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National Academy of Engineering Inductees

Longstanding AAAR members were elected to the National Academy of Engineering in 2019. **Drs. Pratim Biswas** and **Kimberly A. Prather** were elected to the National Academy of Engineering and inducted on October 5, 2019 in a ceremony in Washington, D.C. **Dr. Susanne V. Hering** was elected to the Academy of Engineering this year and will be inducted on October 4, 2020.

https://www.nae.edu/204037/National-Academy-of-Engineering-Elects-86-Members-and-18-Foreign-Members

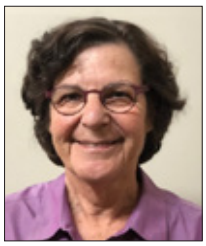
https://www.nae.edu/224584/National-Academy-of-Engineering-Elects-87-Members-and-18-International-Members

Dr. Pratim Biswas
Lucy and Stanley Lopata Professor and Chair,
Department of Energy, Environmental,
and Chemical Engineering
Washington University in St. Louis

For advancing the science of aerosol dynamics and particle removal technologies.

Dr. Kimberly A. Prather
Distinguished Chair in Atmospheric Chemistry,
Department of Chemistry and Biochemistry
Scripps Institution of Oceanography
University of California, San Diego

For technologies that transformed understanding of aerosols and their impacts on air quality, climate, and human health.



Susanne V. Hering
Founder and President,
Aerosol Dynamics Inc., Berkeley, Calif.

For advances in aerosol measurements and instrument commercialization.

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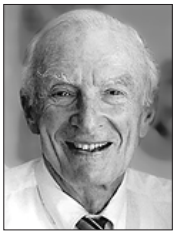
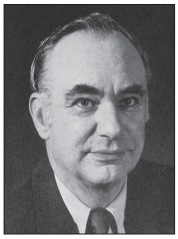
AAAR has several other members who are (were) members of the National Academy of Engineering.


Sheldon Friedlander
Elected 1975


Kenneth Whitby
Elected 1978


John H. Seinfeld
Elected 1982


Benjamin Y.H. Liu
Elected 1987


James Pankow
Elected 2009


Richard Flagan
Elected 2010


Charles Kolb
Elected 2013


David Pui
Elected 2016

38th Annual Meeting Announcements

Planning is in full swing for an exciting, interesting, and enjoyable **2020 Annual Conference this October in Raleigh, NC**. Four diverse special symposia will join the usual subject areas for this meeting:

1) ***Satellite-Data and Environmental Health Applications***
2) ***Environmental Justice: Technology, Frameworks, and Outcomes***
3) ***Dusty Plasma***
4) ***Missing contributors to SOA: The Role of Volatile Chemical Products (VCPs)***

Please refer to the conference website for additional information about the content and organizers of these symposia.

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In addition, the 2020 Annual Conference will feature four exciting plenary speakers who will provide their insights on a wide range of aerosol topics:

Marit Meyer, NASA | Aerosols in Space Exploration

Ann Marie Carlton, UC Irvine | Atmospheric Aerosols

Doug Worsnop, Aerodyne | Aerosol Mass Spectrometry

David Kittelson, University of Minnesota | Evolution of PM Emissions with Engine Technology

Keep a look out for the **Call for Abstracts**. Emails announcing the Call for Abstracts and member abstract submission codes should have already arrived in your in-boxes. The abstract submission **deadline** is **May 1** ***(no extensions)***, so don't delay; submit your abstract ideas right away. Also, please encourage your friends and colleagues who are not regular attendees to participate in the 2020 conference. This is especially appreciated for the special symposia, which present an opportunity for us to exchange ideas with other research communities.

As mentioned in the President's message, we are monitoring the Coronavirus (SARS-COV-2) and COVID-19 outbreak for any potential impact to the 2020 AAAR Annual Meeting and will **communicate any changes to the AAAR membership and conference registrants via email and the conference website**. We are currently proceeding with the original conference planning. ●

Matti Maricq, *2020 Conference Chair*

Call for Award Nominations

The Awards Committee of the American Association for Aerosol Research (AAAR) invites you to submit nominations for six awards to recognize outstanding contributions in the field of aerosol science.

- **The AS&T Outstanding Publication Award**
  Is awarded annually to one paper published in Aerosol Science and Technology (AS&T) without regard to publication date.
- **The Kenneth T. Whitby Award**
  Recognizes outstanding technical contributions to aerosol science and technology by a young scientist.
- **The David Sinclair Award**
  Recognizes sustained excellence in aerosol research and technology by an established scientist still active in his/her career.
- **The Sheldon K. Friedlander Award**
  Recognizes an outstanding dissertation by an individual who has earned a doctoral degree.
- **The Benjamin Y. H. Liu Award**
  Recognizes outstanding contributions to aerosol instrumentation and experimental techniques that have significantly advanced the science and technology of aerosols.
- **The Thomas T. Mercer Joint Prize Award**
  Recognizes excellence in the areas of pharmaceutical aerosols and inhalable materials.

Award Nominations are Due May 8, 2020

Send an email to **info@aaar.org** or visit **https://www.aaar.org/awards/annual-awards** to receive specific instructions regarding the nomination process for each award.

All awards will be announced and presented at the AAAR 38th Annual Conference being held on October 5-9, 2020 in Raleigh, North Carolina. ●

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AS&T Article Highlight

By Kerry E. Kelly

"The Spider DMA: A Miniature Radial Differential Mobility Analyzer"

Stavros Amanatidis, Changhyuk Kim, Steven R. Spielman, Gregory S. Lewis, Susanne V. Hering, and **Richard C. Flagan (2020), Aerosol Science and Technology, Volume 54, Issue 2: Low-Cost Air Sensors, Pages 175-189.**

https://doi.org/10.1080/02786826.2019.1626974

Classifying aerosols by differential electrical mobility is a critical tool for aerosol scientists seeking to study particles smaller than 500 nm. However, instruments based on this principle tend to be costly and bulky, with large power requirements, making them difficult to deploy in efforts to obtain more highly resolved geospatial measurements of these ultrafine particles. Amanatidis and co authors developed a miniature radial differential mobility analyzer (RDMA), called the Spider DMA, for measuring particle size distributions in the 10 – 500 nm range. The Spider DMA is compact (12 cm x 6 cm) and lightweight (350 g). In order to achieve the desired power, size and performance targets, they developed a novel inlet strategy by introducing several pressure drop steps along the inlet flow path and by introducing the sheath and aerosol streams as directly opposing jets. *Figure 2a of the paper illustrates the design*.

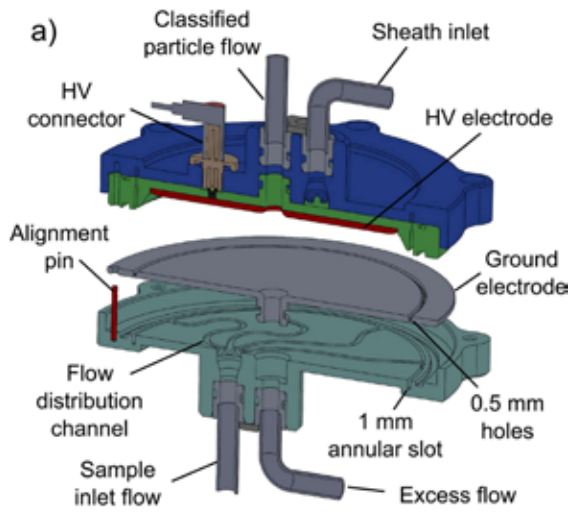

Figure 2a (from paper)

Schematic of the Spider DMA, demonstrating key design features and assembly parts in "exploded" section-cut view.

They performed a theoretical analysis, COMSOL simulations, and experimental evaluation of the Spider DMA *(as shown in Figure 9 of the paper on the following page*). The simulations and experimental characterization showed excellent agreement and a linear response in mobility classification over a three orders of magnitude mobility range. Compared to polystyrene latex spheres of known sizes, they found the uncertainty in sizing to be less than 2%. This study highlights an important step in the development of DMAs that could enable their use in broader applications, such as distributed sensor networks and mobile platforms.

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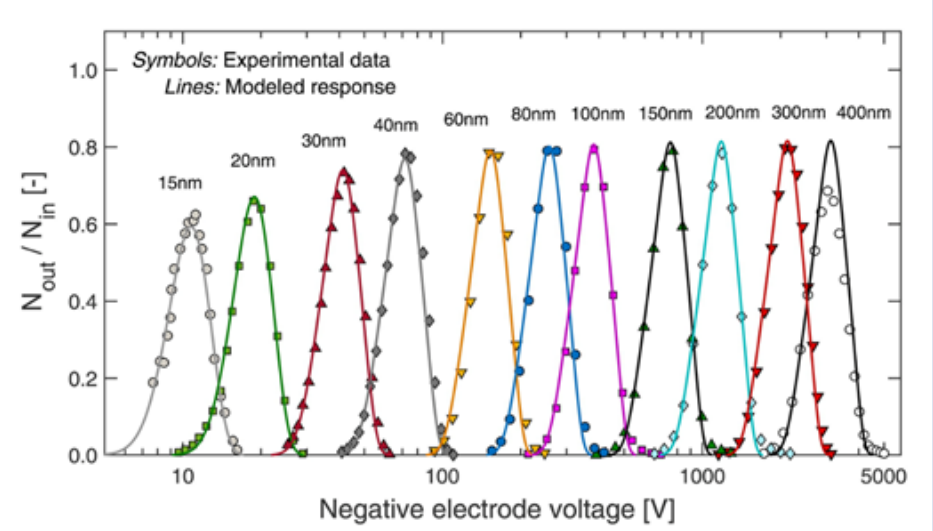

Figure 9 (from paper)

The fraction of mobility-classified NaCl or (NH4)2SO4 particles that are transmitted through the Spider DMA as a function of the applied voltage, with quasi-monodisperse particles in the 15–400 nm size range. The classifier was operated in "stepping" voltage mode, and 0.9/0.3 L/min sheath/sample flowrates. Symbols represent experimental data with size-selected particles. Solid lines demonstrate modeled response based on the parameterized Stolzenburg transfer function derived from finite element simulations. ●

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Three New AS&T Video Vignettes NOW Online

Aerosol Science and Technology is pleased to introduce three new video vignettes featuring the following articles selected from those chosen by our Editorial Advisory Board (EAB) as Notable Papers for 2019. These videos will be linked to their respective articles on our journal website and added to the AAAR's online repository of video resources, but they are also viewable through the links provided below. We hope that you enjoy them and that you will consider submitting a manuscript to AS&T so that it can be considered for selection by our Editors and EAB as a future video vignette:

Jason Olfert and **Steven Rogak**

Universal Relations Between Soot Effective Density and Primary Particle Size for Common Combustion Sources

https://player.vimeo.com/external/395800018.source.mp4?s=66569fffdc73319c6534ccbfb53f43e98789e4c0&download=1

Joanie Lemieux, **Marc Veillette**, **Hamza Mbareche**, and **Caroline Duchaine**

Re-Aerosolization in Liquid-Based Air Samplers Induces Bias in Bacterial Diversity

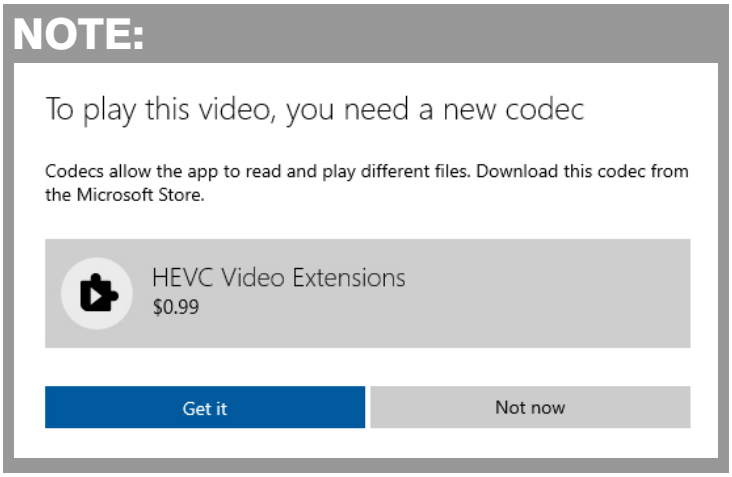
https://player.vimeo.com/external/396574396.source.mp4?s=34abfdeea68a4788737455c4287bbefc2e9e1e5e&download=1

Eleanor C. Browne, **Xiaolu Zhang**, **Jonathan P. Franklin**, **Kelsey J. Ridley**, **Thomas W. Kirchstetter**, **Kevin R. Wilson**, **Christopher D. Cappa**, and **Jesse H. Kroll**

Effect of Heterogeneous Oxidative Aging on Light Absorption by Biomass Burning Organic Aerosol

https://player.vimeo.com/external/396761488.source.mp4?s=427d11977805f585dd4cf11aa94dad9e3fcecf94&download=1 ●

NOTE:



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Aerosol Scientist in the Spotlight

By Kerry E. Kelly

Dr. Lupita Montoya
Research Associate of Environmental Engineering at the University of Colorado Boulder

Research Website:
https://www.colorado.edu/ceae/lupita-montoya

1. How did you get involved in the aerosol science community, or how did you first become interested in aerosol science?

My interest in aerosol science had an interesting beginning. As a senior in engineering (mechanics) at California State University, Northridge, I worked on a capstone project where we made engine modifications in a regular automobile so that it could operate with an alternative fuel (i.e., gasoline and methanol). My favorite part from this year-long project, which I shared with a team of about 15 guys, was the emissions testing we performed after we made the engine modifications. Since I lived in the Los Angeles area at the time, I thought that I could help the environment and people by designing "cleaner" cars. That was my stated goal when I applied to the Mechanical Engineering Dept. at Stanford University for graduate school. Unfortunately, while pursuing my MS degree there, I found out that Stanford did not have research in that particular area, so I felt somewhat disappointed. Luckily, I became aware of the aerosol research **Dr. Lynn Hildemann** was pursuing in Environmental Engineering, also at Stanford. While I never had heard of Environmental Engineering, I was willing to look into it and I am glad I did: I found my passion. Although Dr. Hildemann did not have research specifically in the area I had envisioned, she made me aware of other, equally important problems to study. In particular, she told me about the increased incidence of diseases like asthma being observed in minority communities in the US, likely liked to indoor pollutants. Since my main motivation was to help people, I found this problem very compelling, as well. Dr. Hildemann gave me an opportunity to join her research team looking at indoor air quality and I have stayed in that field ever since. I am now pursuing research that truly reflects my scientific and personal interests.

2. Which people or programs in our field have been the most influential to you and your path, or who have most influenced your ideas about aerosol research?

My PhD advisor at Stanford, Dr. Lynn Hildemann introduced me to rigorous technical work in aerosol science in the then nascent area of bioaerosols. Another one of my Stanford advisors, **Dr. Jim Leckie**, inspired me with his research about pesticide exposure of migrant farm

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workers in California. He suggested I do postdoctoral work with communities so that I could meet my personal goal of working with people. Following his advice, I conducted postdoctoral research in the School of Public Health at the State University of New York, where **Dr. David O. Carpenter** advised me on a project looking at indoor allergens and asthma in the Mohawk Nation. That was my first time working with underserved communities and I learned a lot in that experience, including the many needs, challenges, and rewards associated with working in such environments. I then pursued another postdoc at Harvard School of Public Health under the advice of **Drs. Petros Koutrakis** (in method development) and **Joseph Brain** (in toxicology), which was also excellent training. Presently, I draw from all these diverse experiences to conduct my own research. Within AAAR, I have also been inspired and mentored by excellent people like **Drs. Cliff Davidson**, **Susanne Hering**, **Rick Flagan**, and **Bill Nazaroff**, among others. Even **Dr. Warren Finlay**, with his elegant fundamental research in fluid mechanics, has influenced me in important ways.

3. You are instrumental in bringing attention to impacts on underserved and minority communities, what inspired you to focus your research in this area?

Using my engineering training to contribute to society was my original motivation for going to graduate school, to pursue my PhD in Environmental Engineering, and to perform postdoctoral research in Public Health. As a first-generation minority scholar in engineering, I feel intimately connected to underserved communities. I feel it is my privilege and responsibility to utilize my excellent training to address environmental issues in these communities. It has taken me decades to find the space where I feel fully congruent as a researcher and as a human being. I am extremely grateful to everyone, including my mentors and peers at AAAR, who helped me get to this point. Unfortunately, I have also become painfully aware of how difficult it is to be successful, in a more traditional sense, as a minority scholar. I feel very fortunate to be part of AAAR, which has been my "safe space" for many years. The great mentorship and collegiality I have received at AAAR has made up for the mostly hostile work environments I have been in as a faculty member. I hope that my efforts in the newly-established AAAR ad hoc committee on Representation and Equity Affairs will make it easier for other minority scholars to reach not only that congruency I value so much, but also actual professional success.

4. What are, in your opinion, the most interesting or important research contributions you've made so far?

So far, my most interesting research contributions stem from my holistic approach to problem-solving, which rests firmly in my engineering training. An area where I have contributed to science is transferring methodologies between fields to expand our understanding and ability to address environmental challenges. For example, I have been using

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inexpensive synthetic jet actuators, traditionally used in aerospace engineering, to efficiently control flows in the indoor environment to improve air quality while reducing the energy load in buildings. I am also particularly proud of my work with the Navajo Nation, which has been truly a labor of love. Here, our novel mixed-method analysis led to the design of a culturally-appropriate heating technology that is now USEPA-certified and brought into this community. Similarly, my work addressing VOC exposure in nail salons, has drawn a lot of recent attention. I hope, however, that my most important research contributions are yet to come.

5. Are there new aerosol research directions that you see as particularly important or interesting?

I think that designing materials that lead to less environmental degradation or negative health effects is extremely important. Some of my most recent research, for example, focuses on expanding theoretical models in fracture mechanics of concrete to include submicronic size fragments (i.e., aerosols), which were not previously accounted for in those models. Working with a civil engineer and a toxicologist, I have also shown how PM2.5 generated during the rapid fragmentation of different reinforced concretes leads to different cellular effects. I think that being able to effectively cross disciplinary boundaries is particularly important.

In a similar way, I think that aerosol science can play an important role in addressing Environmental Justice issues globally. Beyond the science and technology, however, I think that new research models, incorporating cultural and social factors are very much needed. Building on my experience with the Navajo Nation, I am now focusing on developing such models. My dream is to leverage the excellent aerosol research taking place at AAAR to make important improvements in the quality of life of underserved communities while also building their human capital. ●

Student Chapter Highlights

Colorado State University – Fort Collins, Colorado

President: **Kelsey Bilsback**

Colorado State University's AAAR chapter aims to connect aerosol researchers across campus. Students, postdocs, and faculty gather approximately once a month for food and drinks at a local spot in Fort Collins to discuss aerosol-related research and to connect outside of the office. Attendees come from departments including: atmospheric science, mechanical engineering, chemistry, and environmental science, among others. Conversations provide inspiration for current and future interdisciplinary aerosol research. Future events will include a student/postdoc-led research project, in 2020.

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University of California, Irvine – Irvine, California

President: **Jonathon Babila**

The AAAR student chapter at UCI has had a busy second year. Closing out 2019, chapter members organized and hosted a workshop geared toward undergraduate students that focused on applying to graduate school, writing a personal statement, and developing a CV. Starting in February of 2020, the Chapter started an open and multidisciplinary journal club to discuss recent academic publications. Recognizing that a lot of grad students don't get much practice writing papers outside of actually writing them, and that it can be difficult to know what makes a good paper, their goal is to give students more opportunities to learn about paper writing from experienced scientists, while also sparking communication among scientific communities at UCI. The inaugural journal club (February 20th) was hosted by UCI Chemistry Professor **Jim Smith** with over 20 attendees. The next monthly journal club meeting will be led by UCI Professor **Alex Guenther** from the Earth System Science Department. Lastly, the Chapter is creating an open tutorial on brown carbon and photochemistry to take place over the summer. For more updates on their monthly journal club, summer seminar, and other events, they happily encourage you to follow their AAAR student chapter twitter account **@AaarUCI**.

Washington University in St. Louis – St. Louis, Missouri

President: **Pradeep Prathibha**

The AAAR student chapter at Washington University in St. Louis is excited to share that their students have established a new, student-coordinated aerosol instrumentation facility, and is looking forward to expanding collaborative research. Additionally, under the guidance of the Center of Aerosol Science & Engineering (CASE, **aerosols.wustl.edu**), the Chapter coordinates technical workshops and seminars that help students develop skills in practical and advanced aerosol topics as well as gain professional networking experience. In Fall 2019, CASE welcomed their newest faculty member, **Dr. Randall Martin**.

Dr. John H. Seinfeld visits Washington University in St. Louis in April 2019 and is named the Center for Aerosol Science and Engineering (CASE) Distinguished Fellow.

In the past year, the Chapter began hosting distinguished aerosol scientists every month for a technical seminar, student-driven discussion, and lab tours. Guests have included **Dr. Yakov Kutsovksy**, **Dr. Anthony Wexler**, **Dr. Arden Pope**, and **Dr. John H. Seinfeld**, who was named the 2019 CASE Distinguished Fellow. In the coming months, they will host **Dr. William Vizuete**, **Dr. Sili Deng**, and **Dr. Daniel Jacob**. Thanks to the generosity of Kanomax USA, Inc., Dr. Jacob will be named the 2020 CASE Distinguished Fellow. ●

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In Case You Missed It

By Gabriel Isaacman-Van Wertz

Health impacts of PM2.5 in the U.S. frequently cross state lines

Recent work by researchers at MIT highlights the importance of regulating air pollution at the federal level. By using new approaches to model the transport of pollutants from their different sources, **Dr. Dedoussi** and co-workers have found that approximately half of all premature mortality from PM2.5 and ozone is actually due to pollution that originated in a different state. This was found to be particularly true for emissions from electric power generation, but was generally observed for emissions from all sectors. Due to long-range transport of pollutants, impacts are not always limited to the state next door, with pollutants from one state leading to mortality hundreds or thousands of miles away. Encouragingly though, the researchers found that the overall number of premature deaths due to air pollution has dropped since 2005, thanks in large part to regulations on the electric power generation industry and on-road emissions.

Read more:

https://www.sciencedaily.com/releases/2020/02/200212131520.htm

Dedoussi, I.C., Eastham, S.D., Monier, E. et al. Premature mortality related to United States cross-state air pollution. Nature 578, 261–265 (2020). https://doi.org/10.1038/s41586-020-1983-8

City in India implements first cap and trade system for PM emissions

In October, a city in India became the first location to implement a cap and trade system for particulate matter. Surat, a city in the state of Gujarat has set caps for the amount of particulate matter 160 local industrial plants can emit, and will allow plants to trade or sell these emissions. While cap and trade is a relatively common approach for tackling greenhouse gas emissions, no region has yet established such a system for emission of particulate matter. This approach is made possible in part by a requirement, instituted over the past few years, for hundreds of factories in the city to install real-time sensors to monitor their emissions. The cap and trade pilot program, a collaboration between the Gujarat Pollution Control Board and a number of academic and non-profit partners, looks to reduce particulate

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emissions by almost 30%, providing a potential model for other cities and regions to mitigate pollution.

Read more:

https://epic.uchicago.edu/news/worlds-first-emissions-trading-scheme-for-particulate-pollution-starts-in-surat/

https://timesofindia.indiatimes.com/city/surat/worlds-first-emission-trading-scheme-yields-positive-results/articleshow/71729263.cms

https://www.bbc.com/news/world-asia-india-48744163

Successful launch of the first satellite in a constellation of geostationary air quality measurements

A new generation of satellites is poised to revolutionize our understanding of atmospheric composition. Most current satellites orbit the globe, providing a worldwide picture of atmospheric composition, but only looking down at an individual location one time per day. Instruments aboard three new satellites will change all that by sitting in geostationary orbits above population centers around the world, providing hourly measurements of aerosol optical depth, ozone, and other atmospheric constituents above North America ("TEMPO"), Europe and the Middle East ("Sentinel-4"), and South and East Asia ("GEMS"). The first of these, GEMS, was successfully launched in February, ushering in a new era of highly time-resolved remote sensing of key atmospheric components. The other two, TEMPO and Sentinel-4, are scheduled for launch in the next three years.

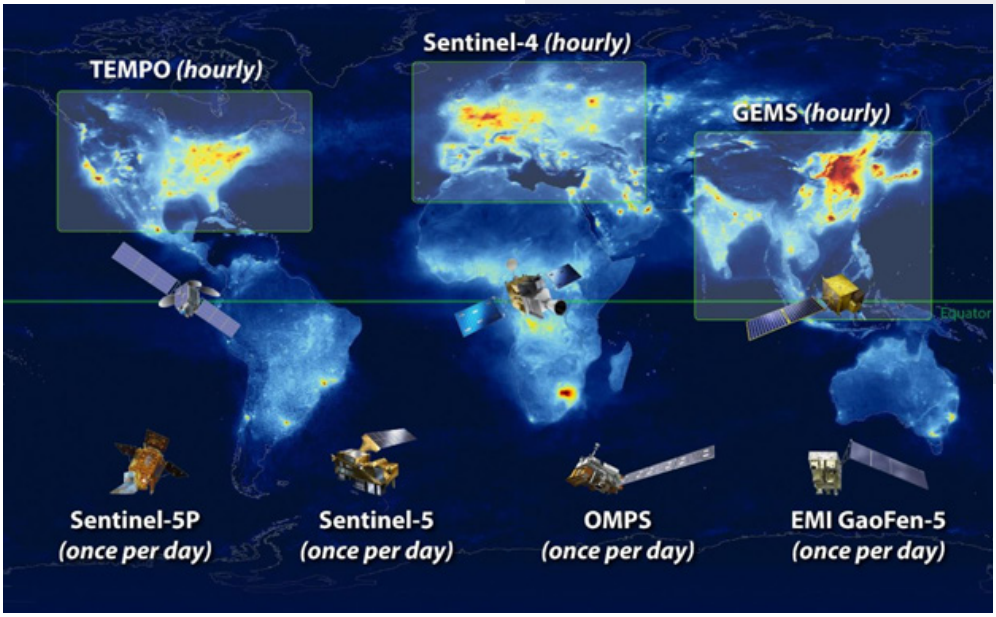

Image from ceos.org

Read more:

http://gems1.yonsei.ac.kr/

https://www.arianespace.com/press-release/ariane-5-success-va252/ ●

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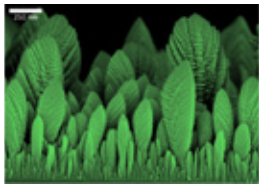
Particle Art Competition 2019 Winners

The following submissions won awards at the 37th AAAR Annual Meeting in Portland, Oregon

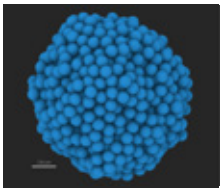
Submicrometer Static Art	
1st Place	**Clayton Kacica** and **Girish Sharma**
2nd Place	**Namsoon Eom**
3rd Place	**Timothy Sipkens**
Larger than Submicrometer Static Art	
1st Place	**Michael Valerino** and **Lucas Rocha-Melogno**
2nd Place	**Nathan Reed**, **Girish Sharma**, and **Pratim Biswas**
3rd Place	**Natalie Smith**, **Jesse Crescenzo**, **Yuanzhou Huang**, **Allan Bertram**, and **Sergey Nizkorodov**
Particle Competition Videos	
1st Place	**Julia Bakker-Arkema** and **Marina Vance** https://www.youtube.com/watch?v=_sMuXtjZndY
2nd Place	**Kayane Dingilian**, **Tong Sun**, **Yang Han**, **Xuepeng (Andrew) Deng**, **Archit Datar**, and **Elizabeth Jergens** https://www.youtube.com/watch?v=L74ZWbschxo
3rd Place	**Mara Otero-Fernandez** and **Allen Haddrell**; https://www.youtube.com/watch?v=Z7P_-s3Loq8&feature=youtu.be

Submicrometer Static Art Winners



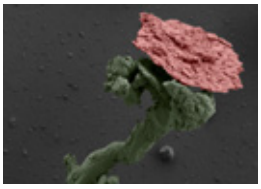
1st Place: Titannium Dioxide Trees

2nd Place: A Cherry Blossom of Gold

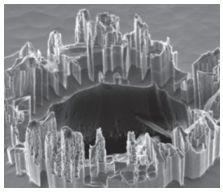


3rd Place: Rendering of an Iron Nanoparticle
Consisting of 1241 Atoms Simulated Using Molecular Dynamics

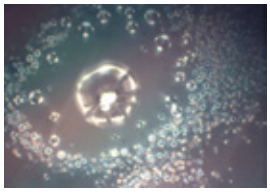
Larger than Submicrometer Static Art Winners



1st Place: Bloom of Dust



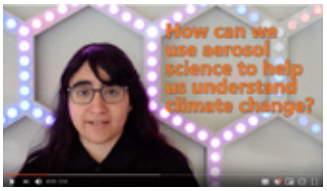
2nd Place: Castle of Satan around the Abyss of Demons



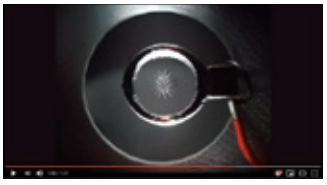
3rd Place: Stressed Particle at the Breaking Point

Video Competition Winners

1st Place



2nd Place



3rd Place

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Key Dates and Reminders

OCTOBER 5–9, 2020
Raleigh Convention Center | Raleigh, NC

In preparation for the 2020 Annual AAAR meeting in Raleigh:

Abstract Submission Deadline May 1, 2020
(no extensions)

Early Bird Registration Deadline July 10, 2020

Late Breaking Abstract/ Poster Deadline July 10, 2020

Hotel Room Cut-off Date September 6, 2020

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