IAMA 2023

International Aerosol Modeling Algorithms Conference

UC Davis Conference Center •
December 6-8, 2023

UCDAVIS AIR QUALITY RESEARCH CENTER

CALIFORNIA AIR RESOURCES BOARD

Program Topics

The 2023 IAMA Conference Program will focus on the following topics:

- Advances in regional and global scale aerosol modeling
- Fundamental aerosol processes from nano- to microscale
- Process and Box Models of Aerosol Chemistry and Physics
- Development, Application, and Reduction of Gas- and/or
- Particle-Phase Chemical Mechanisms for Aerosol Predictions
- Air Quality Modeling for Health and Regulatory Assessments
- Machine Learning and Data Science

Take a closer look at the session descriptions below to gain a better understanding of the topics and themes that will be covered at this year's conference.

Advances in regional and global scale aerosol modeling

Simulating the formation and physico-chemical properties of particles in the atmosphere at regional and global scales remains a significant challenge. In addition to computationally efficient algorithms to represent complex aerosol processes, detailed model evaluation is needed with respect to multiple features and properties of particles (e.g., vertical profiles, size, composition, optical properties) that affect their impacts on climate and health. Here we invite recent advances in regional and global-scale modeling of particles relevant to climate and human health, developments of computationally efficient algorithms to represent these processes in models, and their evaluation with laboratory and field measurements. We particularly encourage contributions highlighting aerosol model intercomparisons for air quality and climate, regional to global aerosol data assimilation and forecast systems, and constraints on aerosol models from current and future remote sensing instruments.

Fundamental aerosol processes from nano- to microscale

The atmosphere is a complex dynamic entity whose composition of gas-phase molecules and aerosol particles varies considerably in space and time. Large-scale atmospheric modeling of the constituents and their effects critically depends on

understanding and representing the chemical and physical properties and processes occurring from nano- to microscale. This session highlights fundamental research on aerosol properties and microphysics, including molecular-level modeling of gas, aerosol and surface phases, assessment of process rates related to, for example, particle formation and growth, and methods for their optimal representation in box and large-scale model frameworks.

Process and Box Models of Aerosol Chemistry and Physics

Process-level models in the atmospheric sciences connect the fundamental physical and chemical properties of gases and aerosols with treatments of mass transport and detailed chemical mechanisms. These models enable atmospheric scientists to utilize results from quantum mechanical calculations, interpret laboratory experiments, and provide a process understanding that can be used in larger scale models such as chemical transport models. This session highlights work using detailed chemical, thermodynamic, and kinetic models on the reactor or box model scale in applications including, for example, gas, particle, and multiphase chemistry or gas-particle partitioning.

Development, Application, and Reduction of Gas- and/or Particle-Phase Chemical Mechanisms for Aerosol Predictions

Secondary aerosol formation proceeds by reactions of volatile compounds in the gas- and/or particle-phases. These reactions are described in models by chemical reaction mechanisms of varying complexity. This session highlights the development, application, and/or reduction of gas- and/or particle-phase chemical mechanisms relevant for aerosol predictions. We welcome abstraction submissions on relevant topics including, but not limited to: mechanisms for unrepresented precursors in SOA models, multi-phase mechanisms, reduction of detailed mechanisms for chemical transport modeling, and adaptation of mechanisms for multi-compartment modeling (e.g., health impacts).

Air Quality Modeling for Health and Regulatory Assessments

The primary goal of this session is to connect fundamental modeling developments and insights discussed in other sessions to applied regulatory and health assessments. The session also aims to illustrate how scientific advances are being used by regulators and the health science community to better understand the impact of pollution management efforts. Discussions in this session are also expected to highlight the emerging challenges in regulatory and health applications that may be met with advanced aerosol model algorithms.

Machine Learning and Data Science

This session provides a forum to discuss modern machine learning and data science techniques as they are applied to open research questions in aerosol science. Our motivation is to foster discussion that can enhance the predictability and understanding of aerosol processes and abundances. We particularly encourage unconventional or early-stage approaches with the potential to transform the practice of aerosol science. We welcome submissions from any subfield, including process-based modeling, data-driven modeling, or multi-source data fusion

techniques.

Prepare for the Program

Offering an exciting opportunity to showcase research to a global audience and connect with fellow professionals in the field!

Call for Abstracts Opens Soon

Are you interested in presenting at the upcoming IAMA Conference? In just a few short weeks, we will be collecting abstract submissions for all conference topics.

Please take note of the dates provided and mark your calendars for April 19th, 2023, which is when the call for abstracts will be released.

Get ready to submit your research!

The Submission Process

The submission form will ask for the following details: a title, a brief abstract, the organization details and biography of the presenting author, and information about any additional authors. Abstracts should be limited to a maximum of 1500 characters, including punctuation/spaces.

You may submit each proposal for consideration for up to three different sessions, and there is no limit to the number of abstracts you can submit.

In the event that your abstract is not chosen for a Podium Presentation, your submission will still be considered for a Poster Presentation / Lightning Talk.

Start preparing your submission materials now to get a head start!

Important Program Dates

April 19, 2023
Abstract Submission Form Opens

June 14, 2023
Deadline to Submit an Abstract

August 11, 2023
Speaker Notified of Acceptance Status

September 6, 2023
Basic Schedule Announced

October 12, 2023
Full Agenda Announced

December 6 - 8, 2023
Conference Dates

Travel Preparations

Passport and Visa Information

If you plan to attend IAMA from a country other than the United States, please do not delay in making VISA arrangements for your entry if needed as it can take several months to be processed. Depending on country of origin and length of stay in the United States, you may or may not require a VISA to enter the country.

Securing VISA arrangements is the responsibility of attendees and participants.

Some countries ask visa applicants to provide supplementary information explaining the purpose of their travel. In this regard, providing a letter of invitation to IAMA 2023 may be useful. If needed, please download this invitation letter to apply for a Visa to attend this year's IAMA Conference.

International Travel Information

Visiting Davis

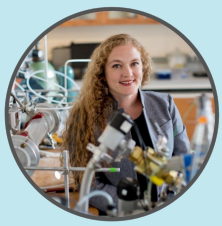
Davis is in the heart of Northern California. Being within 2.5 hours of any type of climate and landscape you want, it's an incredible place to visit. We look forward to welcoming you to campus this upcoming Winter!

Hotel Room Block Information Coming Soon.

Learn more about the TPC

The Technical Program Committee is working diligently to curate an exceptional lineup of sessions and networking opportunities. Abstract submissions will be reviewed by these global researchers and educators.

Learn more about the Committee team by reading their biographies below!



Faye McNeill *(Co-Lead Chair)*

Columbia University, Professor

V. Faye McNeill is a Professor and Vice Chair in the Department of Chemical Engineering and a professor in the Department of Earth and Environmental Sciences at Columbia University. She is also Principal Investigator of the Columbia University Clean Air Toolbox for Cities Initiative. She joined Columbia in 2007 and received tenure in 2014. She received her B.S. in Ch.E. from Caltech in 1999 and her PhD in Ch.E. from MIT in 2005, where she was a NASA Earth System Science Fellow. From 2005-2007 she was a postdoctoral scholar at the University of Washington Department of Atmospheric Sciences. She received the NSF CAREER and the ACS Petroleum Research Fund Doctoral New Investigator awards in 2009. She was the recipient of the Kenneth T. Whitby Award of AAAR in 2015 and the Mellichamp Emerging Leaders lectureship at UCSB in 2018. She was named Fellow of the Royal Society of Chemistry in 2023. She is the Associate Editor in charge of Atmospheric Chemistry for ACS Earth and Space Chemistry. She was a co-editor of Atmospheric Chemistry and Physics from 2007-2017. She has served in multiple elected officer positions in AIChE, AAAR, and AGU, including Vice President (2022-2023) and

President (2023-2024) of AAAR. She is an appointed member of the IUPAC panel on kinetic data evaluation and the ACS Committee on Environmental Improvement.

Andreas Zuend *(Co-Lead Chair)*

McGill University, Associate Professor

Andi Zuend is a Professor in the Department of Atmospheric & Oceanic Sciences at McGill University in Montreal, Canada. He obtained a Diploma in Environmental Systems Sciences (2003) and a PhD degree in Atmospheric Chemistry (2008), both from ETH Zurich, Switzerland. He is interested in understanding various physicochemical aerosol processes and their model representations, primarily to advance our understanding of air quality and aerosol-cloud-climate impacts. Andi's research group works on the thermodynamic and kinetic box and/or 3D modeling of multicomponent, multiphase aerosols. Projects include applications and development of predictive methods for equilibrium gas-particle partitioning and liquid-liquid phase separation, phase viscosities, bulk-surface partitioning, hygroscopic growth and cloud droplet activation, and the development of reduced-complexity frameworks for organic aerosols representations.

Jeremy Avise

CARB, Modeling and Meteorology Branch Chief

Dr. Jeremy Avise is Chief of the Modeling and Meteorology Branch at the California Air Resources Board (CARB). Jeremy leads a team of scientists, engineers, and meteorologists who are responsible for conducting regional and local scale modeling in support of State Implementation Plan (SIP) development for ozone and PM2.5, regulatory/rule development, air toxics risk assessments, and CARB's Community Air Protection Program. In addition, Jeremy's team oversees the State's Smoke Management program for agricultural and prescribed burning.

Kelley Barsanti

NCAR, Research Scientist

Dr. Kelley Barsanti is a Scientist at the National Center for Atmospheric Research (NCAR) in the Atmospheric Chemistry Observations and Modeling (ACOM) Laboratory. Prior to joining ACOM, she was an Associate Professor at the University of California Riverside (UCR). Dr. Barsanti has developed a research program contributing comprehensive measurements of gaseous organic compounds from understudied sources (e.g., wildland fires) and during critical time periods (e.g., COVID shelter-in-place); and building mechanistic models to explain laboratory and field observations of atmospherically relevant organic gasses and particles. Much of Dr. Barsanti's recent work has focused on emissions and air pollutant formation from wildfires. She is currently focused on the development of community tools and resources that will serve a more diverse and expansive group of users and promote greater impact of ongoing research efforts in her own lab and across research communities. These efforts are particularly important given the increase in the frequency and severity of wildfires, as well as the complexity associated with developing scientific understanding, reliable modeling tools, and appropriate mitigation strategies.

Co-Chairing Development, Application, and Reduction of Gas- and/or Particle-Phase Chemical Mechanisms for Aerosol Predictions Session

Thomas Berkemeier

Max Planck Institute for Chemistry, Research Group Leader

Thomas Berkemeier is a research group leader at the Max Planck

Institute for Chemistry, Mainz, Germany. His research is centered around the mathematical description of multiphase processes in the atmosphere and the human body. His research team develops kinetic models and conducts laboratory experiments with the goal of understanding the chemistry and physics of atmospherically- and health-relevant processes at and across interfaces. The modelling of detailed chemical, physical and biological processes is supported by data-centric approaches and algorithms, including machine learning.

Co-Chairing Process and Box Models of Aerosol Chemistry and Physics Session

Chenxia Cai

CARB, Regional Air Quality Modeling Section Manager

Chenxia Cai received her PhD in Atmospheric Science from State University of New York at Albany. She has applied air quality models to study various topics related with the formation of ozone and particulate matters. Chenxia is currently the manager of the Regional Air Quality Modeling Section in California Air Resources Board (CARB). Her section is responsible for carrying out the state-of-the-science meteorology and air-quality modeling required for control strategy evaluation and development, pollution transport assessment, and State Implementation Plan (SIP) updates for all criteria pollutants and regional haze in California. Her section also provides modeling support for all major field studies in California as well as other research activities at CARB.

Chris Cappa

UC Davis, Professor

Professor Cappa is interested in quantifying and understanding the processes that control the emission, evolution, and impacts of atmospheric aerosols. The Cappa group carries out laboratory and field studies, and develops and applies simple models, to characterize and predict aerosol physical, chemical and optical properties. Their work informs the development of more effective air pollution control strategies and air pollution and climate models, and provides insights into the atmospheric behavior of small particles.

Daven Henze

University of Colorado, Boulder, Associate Professor

Dr. Daven Henze is an associate professor and the S. P. Chip and Lori Faculty Fellow in the Department of Mechanical Engineering at the University of Colorado Boulder. He holds a Ph.D. in Chemical Engineering from Caltech. Prior to joining the faculty at CU Boulder he was an Earth Institute Postdoctoral Fellow at Columbia University, where he worked at the NASA Goddard Institute for Space Studies. Dr. Henze's research focuses on air quality, long-range pollution transport, and climate change. This encompasses more specific interests in remote sensing, adjoint sensitivity analysis, inverse problems, and source apportionment. Dr. Henze has received an EPA Early Career award and a NASA New Investigator award. He is the lead scientist for the GEOS-Chem adjoint model, a member of the GEOS-Chem Steering Committee, a member of the EPA Clean Air Scientific Advisory Committees (CASAC) for Lead and SOx/NOx, and a member of the NASA Earth Science Advisory Committee (ESAC).

Co-Chairing Advances in regional and global scale aerosol modeling Session

James (Jim) Kelly

US EPA Office of Air Quality Planning & Standards,

Researcher

Jim is an Environmental Scientist with the U.S. Environmental Protection Agency where he leads the Air Quality Assessment Division's PM NAAQS Review Team. Prior to this, he held positions at the California Air Resources Board, Lawrence Livermore National Laboratory, and the CIIT Centers for Health Research related to air quality modeling and particle dosimetry. Jim earned a PhD from UC Davis with a dissertation on water uptake by atmospheric particles.

Co-Chairing Air Quality Modeling for Health and Regulatory Assessments Session

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Tinja Olenius

Swedish Meteorological and Hydrological Institute (SMHI), Researcher

Tinja Olenius is a research scientist at the Swedish Meteorological and Hydrological Institute (SMHI). Her research interests include aerosol physics and air quality modeling from molecular processes to box models and large scale. The current work on aerosol modeling focuses on new-particle formation dynamics and growth of newly-formed molecular clusters to larger nanoparticles, as well as implementing process-scale results in larger-scale models to improve the description of aerosol sources and number concentrations.

Co-Chairing Fundamental aerosol processes from nano- to microscale Session

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Havala Pye

US EPA, Research Scientist

Dr. Pye is a research scientist in the US EPA Office of Research and Development where she uses computer models to understand what governs chemicals in air: from emissions through chemical and physical transformation and ultimately removal. She is currently leading efforts to build a new chemical mechanism for use in CMAQ and that couples gas and organic aerosol chemistry. Dr. Pye is a recipient of a Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers. Dr. Pye received her PhD in 2011 in Chemical Engineering with a minor in Environmental Science and Engineering from the California Institute of Technology.

Co-Chairing Air Quality Modeling for Health and Regulatory Assessments Session

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Nicole Riemer

University of Illinois at Urbana-Champaign, Professor

Nicole Riemer is a Professor at the Department of Atmospheric Sciences and an Affiliate of the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. She received her Doctorate degree in Meteorology from the University of Karlsruhe, Germany. Her research focus is the development of computer simulations that describe how aerosol particles are created, transported, and transformed in the atmosphere. Her group uses these simulations, together with observational and satellite data, to understand how aerosol particles impact human health, weather, and climate. She has received the NSF CAREER award, the AGU Ascent Award, and the College of Liberal Arts & Sciences Dean's Award for Undergraduate Teaching. She is an editor for Aerosol Science & Technology and for the Journal of Geophysical Research.

Co-Chairing Process and Box Models of Aerosol Chemistry and Physics Session

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Karine Sartelet

Centre d'Enseignement et de Recherche en Environnement Atmosphérique, Researcher

Karine Sartelet is a research scientist at CEREA, Ecole des Ponts, France. She received her PhD from Cambridge University (UK) in 2002, and was a postdoc fellow at CRIEPI (Japan) in 2004-2005. For the past two decades, her research has focused on modelling aerosols at different spatial scales (regional and local), taking into account the formation and evolution of ultrafine particles, as well as the properties of aerosol compounds, particularly for gas-particle partitioning (e.g. affinity with water, mixing state), and their interactions.

Co-Chairing Development, Application, and Reduction of Gas- and/or Particle-Phase Chemical Mechanisms for Aerosol Predictions Session

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Sam Silva

University of Southern California, Assistant Professor

Sam Silva is an assistant professor in the Department of Earth Sciences and the Department of Civil and Environmental Engineering at the University of Southern California. His research is focused on air pollution and climate change, with particular interest in the convergence of traditional computational methods with modern data science and artificial intelligence techniques.

Co-Chairing Machine Learning and Data Science Session

Christopher Tessum

University of Illinois, Professor

Dr. Christopher Tessum joined the CEE department as an Assistant Professor in January 2020. His research focuses on modeling air pollution and its health impacts, quantifying inequities in the distribution of those impacts, and proposing and testing solutions. He studies the relationships between emissions, the human activities that cause them, and the resulting health impacts, and he develops modeling capabilities to enable these types of analyses.
Before joining UIUC, Dr. Tessum was a research scientist in the Department of Civil and Environmental Engineering at the University of Washington in Seattle and a postdoctoral researcher in the Department of Bioproducts and Biosystems Engineering at the University of Minnesota. He received a Ph.D. (2014) in Civil, Environmental and Geo- Engineering, and a B.M.E. in Mechanical Engineering (2006), from the University of Minnesota.

Co-Chairing Machine Learning and Data Science Session

Knut Von Salzen

Environment and Climate Change Canada (ECCC), Senior Research Scientist

Dr. Knut von Salzen is a senior research scientist at the Canadian Centre for Climate Modelling and Analysis (CCCma) at Environment and Climate Change Canada in Victoria, British Columbia. His current research interests are focused on short-lived climate forcers (SLCFs) and Arctic climate. He is the lead author of a recent report chapter on the impacts of SLCFs on Arctic climate and air quality by the Arctic Monitoring and Assessment Programme (AMAP). Throughout his career, he has contributed to the development and use of aerosol and cloud modeling capabilities in climate and air quality models.

Co-Chairing Advances in regional and global scale aerosol modeling Session

Dan Westervelt

Columbia University, Assistant Research Professor

Dr. Daniel M. Westervelt is an Assistant Research Professor at Lamont-Doherty Earth Observatory (LDEO). Dr. Westervelt is also an affiliate faculty member of the Columbia University Data Science Institute, an affiliated scientist with NASA Goddard Institute for Space Studies, and an air pollution advisor to the US State Department. He is also a Columbia University Climate and Life Fellow. His current research spans from air quality and climate modeling to deployment and calibration of low cost sensors for air quality. Prior to his faculty position at Lamont-Doherty Earth Observatory, he worked as an Associate Research Scientist at LDEO, and as a Science, Technology, and Environmental Policy (STEP) postdoctoral research associate at Princeton University. He completed his PhD degree in May 2013 in Civil and Environmental Engineering from Carnegie Mellon University.

Co-Chairing Fundamental aerosol processes from nano- to microscale Session

Share the News

Help us spread the word about the presentation opportunities available and encourage your colleagues to submit their own abstracts! By sharing this exciting opportunity, you can help promote innovative research and thought-provoking ideas in your field.

This three-day conference brings together a diverse group of research scientists, experts, and professionals from around the world, to discuss the latest advancements and foster continued research of physics and algorithms in particulate matter (PM) models.

If you know someone who would be interested in speaking at the event, please feel free to forward this email and encourage them to sign up for our email list here!

Thank you CARB

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Did someone forward you this email?

IAMA brings together scientists and engineers from around the globe to share their research findings and discuss new approaches and methods to improve our ever-developing understanding of how the chemical constituents of our atmosphere impact the earth's climate and the air upon which all life depends.

Stay informed about the exciting program developments and updates for this year's IAMA conference by signing up for our mailing list.

For more information, visit the event website.

Questions? Contact the Conference Manager, Olivia Schlanger at oschlanger@ucdavis.edu

UC Davis Air Quality Research Center | Bainer Hall - MAE, One Shields Ave., Davis, CA 95616