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RESEARCH INTEREST

Air quality instrumentation, atmospheric aerosols, experimental aerosol science, aerosol instrumentation, aerosol chemistry, physicochemical properties of secondary organic aerosols, large data analysis, air pollution and control, ozone formation.

ACADEMIC PREPARATION

University of California, Davis
Postdoc in Air Quality Research Center (AQRC) July 2023 – present
Supervisor: Prof. Anthony S. Wexler

North Carolina State University
Postdoc in Atmospheric Sciences October 2022 – July 2023
Supervisor: Prof. Markus D. Petters; Co supervisor: Prof. Nicholas Meskhdize

North Carolina State University
PhD in Atmospheric Sciences August 2018 – October 2022
Dissertation: Experimental determination and prediction of the physicochemical properties of secondary organic aerosols.
Advisor: Prof. Markus D. Petters

Istanbul Technical University June 2013 – June 2017
MSc in Atmospheric Sciences
Thesis: Spatial and temporal variation of O_3, NO and NO_2 concentrations at rural and urban sites in Marmara region of Turkey**.**
Advisor: Prof. Selahattin Incecik

Istanbul Technical University September 2009 – June 2013
BSc in Chemical Engineering
Project: Benzene, toluene, ethylbenzene, xylene (BTEX) measurements in Istanbul Kagithane district.
Advisor: Prof. Hasancan Okutan

INSTRUMENTS EXPERIENCE

Gas Chromatography–Mass Spectrometry (GC/MS), Differential Mobility Analyzer (DMA)/Scanning Mobility Particle Sizer (SMPS), Condensation Particle Counter (CPC), Humidified Tandem Differential Mobility Analyzer (HTDMA), Portable Optical Particle Counter (POPS), Continuous Flow Diffusion Chamber (CFDC), Electrostatic Precipitator, Unipolar Diffusion Aerosol Charger (UDAC), Electrospray Aerosol Generator, Single Particle Soot Photometer (SP2), Thermo-Gravimetric Analysis (TGA) & Differential Scanning Calorimetry (DSC), Fourier Transform Infrared Spectroscopy (FTIR).

FIELD EXPERIENCE

I worked in the DOE's TRacking Aerosol Convection interactions ExpeRiment (TRACER) campaign under the TRACER-Particle Flux Measurements branch. I stationed at the main site La Porte, TX where I was responsible for data collection, measurements of aerosol hygroscopic growth factors, black carbon, particle size distributions, and particle fluxes using the eddy-covariance technique in summer 2022 (June-September).

WORK AND RESEARCH EXPERIENCE

University of California, Davis

Postdoctoral Research Associate July 2023 – current

- Developed a portable GC/MS instrument for hazardous air pollutants (HAPs) and smoke taint in grapes for wine industry by GC/MS.
- Collaborated with faculty members including UC Davis and UC San Diego for an air monitoring project to outreach disadvantaged communities in California to evaluate their exposure to air pollutants such as HAPs as well as to solve their air pollution concerns.
- Advised graduate/undergraduate students for their research.

North Carolina State University October 2022 – June 2023

Postdoctoral Research Associate

- Analyzed TRACER campaign's data including hygroscopicity parameter, black carbon measurements collected from summer 2022.
- Explored new particle formation events and mixing state of black carbon over polluted Houston, TX metropolitan area.

Graduate Research Assistant (08/2018-10/2022)

- Explored in-situ measurement of viscosity and ice nucleation ability for sub-200 nm size particles in colder temperatures.
- Identified viscosity, glass transition, and fragility features of the secondary organic compounds at tropospheric conditions by performing aerosol research experiments at extreme dry and cold temperature conditions.
- Assembled and improved the experimental setup of Dimer, Coagulation, Isolation and Coalescence (DCIC) technique for colder temperature for sub 100 nm particles to measure the viscosity of aerosol (sucrose and citric acid).
- Serial data communication to instrument experience with temperature sensors with Julia language. control temperature.
- Performed aerosol size distribution measurement using Scanning Mobility Particle Sizer.
- Designed, produced, and characterized an open-source hardware of low-cost compact electrostatic precipitator.
- Wrote numerous Julia scripts to automate the instrument control and to post process large experimental datasets; to model aerosol size distribution and viscosity measurements (all published studies have open access to Julia scripts).

University of Colorado Boulder September 2019

Visiting Graduate Student

- Conducted part of experiments of my PhD dissertation study.
- Expended volatility experiments to the variety of secondary organic aerosol precursors produced in environmental chamber line of the University of Colorado Boulder laboratory.
- Explored the deposition mode ice nucleation behavior of the secondary organic aerosol precursors through Continuous Flow Diffusion Chamber (CFDC) instrument of Colorado State University.

Istanbul Technical University September 2013 – June 2017
Graduate Research Assistant
M.Sc. Thesis (2013-2017):

- Analyzed the temporal and spatial variations of O_3, NO and NO_2 concentrations identifying urban and rural regions of the Marmara Region, Turkey (Population: over 20 million).
- Identified the correlation between the weather conditions and the air pollutants produced by atmospheric chemical reactions by using AOT40 indices of forestry regions.
- Performed HYSPLIT modeling of backward air-mass trajectories for the ozone and ozone precursors.

Ideal Polymer Chemistry R&D Inc. Company October 2015 – June 2018
Research and Development Engineer (experimental expert)

- Designed-performed experiments to produce first inherently flame-retardant water-based polyurethane.
- Determined Limited Oxygen Index (LOI) of various polyurethane by combustion experiments.
- Worked on the first halogen-free flame retardant polyurethane and artificial leather from PVC.

TEACHING EXPERIENCE

North Carolina State University August 2019 – May 2021
Graduate Teaching Assistant:

Introduction to Computing in the Geosciences (MEA 217) - in person delivery in Fall 2019, online delivery in Fall 2020

- Served as a teaching assistant for Introduction to Computing in the Geosciences for mostly sciences disciplines including Marine, Earth, and Atmospheric Sciences and some Computer Engineering including ~25 students.
- Assisted with preparation of course materials, homework and exam problems.
- Graded weekly homework and quiz.

Earth System Science (MEA 100) - in person delivery in Spring 2020, online delivery in Spring 2021

- Led weekly laboratory sections for MEA 100 Earth System Science and graded weekly materials in Spring 2020 and Spring 2021 both in person and online version including ~25 students.
- Graded weekly assignments.

PUBLICATIONS

Journal Papers:

1) **Sabin Kasparoglu,** Lintong Cai, Nicholas Meskhidze, and Markus D. Petters "Evolution of refractory black carbon mixing state in an urban environment", Atmospheric Environment, (to be submitted, Spring 2024).
2) **Sabin Kasparoglu**, Nicholas Meskhidze, and Markus D. Petters "Influence of sea breeze circulation on aerosol mixing state, new particle formation, and cloud droplet number concentration in an urban environment" (to be submitted, Spring 2024).
3) Markus D. Petters, Tyas Pujiastuti, Ajmal Rasheeda Satheesh, **Sabin Kasparoglu**, Bethany Sutherland, and Nicholas Meskhidze "Wind-driven emissions of coarse-mode particles in an urban environment, Atmos. Chem. Phys., **24**, 745–762, https://doi.org/10.5194/acp-24-745-2024, (2024).
4) Sunandan Mahant, Emil M. Iversen, **Sabin Kasparoglu**, Merete Bilde, Markus D. Petters "Direct measurement of the viscosity of ternary aerosol mixtures" Environ. Sci.: Atmos., Environ. Sci.: Atmos., 2023, **3**, 595-607, https://doi.org/10.1039/D2EA00160H (2023).
5) **Sabin Kasparoglu,** Mohammad Maksimul Islam**,** Nicholas Meskhidze, Markus D. Petters "Characterization of a modified printed optical particle spectrometer for high-frequency and high-precision laboratory and field measurements." Atmos. Meas. Tech., **15**, 5007–5018, https://doi.org/10.5194/amt-15-5007-2022 (2022).

6) **Sabin Kasparoglu**, Russell Perkins, Paul J. Ziemann, Paul J. DeMott, Sonia M. Kreidenweis, Zachary Finewax, Benjamin L. Deming, Marla P. DeVault, Markus D. Petters "Experimental determination of the relationship between organic aerosol viscosity and ice nucleation at upper free tropospheric conditions." Journal of Geophysical Research: Atmospheres, **127**, e2021JD036296, https://doi.org/10.1029/2021JD036296 (2022).
7) **Sabin Kasparoglu**, Timothy P. Wright, and Markus D. Petters "Open-hardware design and characterization of an electrostatic aerosol precipitator", HardwareX, **11**, e00266, https://doi.org/10.1016/j.ohx.2022.e00266 (2022).
8) **Sabin Kasparoglu,** Ying Li, Manabu Shiraiwa, and Markus D. Petters "Toward closure between predicted and observed particle viscosity over a wide range temperature and relative humidity". Atmos. Chem. Phys., **21**, 1127-1141, https://doi.org/10.5194/acp-21-1127-2021 (2021).
9) Markus D. Petters and **Sabin Kasparoglu** "Predicting the influence of particle size on the glass transition temperature and viscosity of secondary organic material". Sci. Rep, **10,** 15170, https://doi.org/10.1038/s41598-020-71490-0 (2020).
10) **Sabin Kasparoglu,** Selahattin Incecik, and Sema Topcu, "Spatial and temporal variation of O_3, NO and NO_2 concentrations at rural and urban sites in Marmara region of Turkey". Atmospheric Pollution Research, **9**(6), 1009-1020, https://doi.org/10.1016/j.apr.2018.03.005 (2018).

CONFERENCES

Conference Abstracts (only first authors once are listed):

11) **Sabin Kasparoglu** and Anthony S Wexler "Towards measuring toxic volatile organic compounds in environmental justice communities" 9th Annual Postdoctoral Research Symposium (April 2024). – Poster
12) **Sabin Kasparoglu**, Mohammad Maksimul Islam, Nicholas Meskhizde, Markus D. Petters "Characterization of an augmented version of the printed optical particle spectrometer for integration into multi-instrument aerosol sampling systems." American Association for Aerosol Research (AAAR), Raleigh, NC (October 2022). - Oral
13) **Sabin Kasparoglu**, Timothy P. Wright, Markus D. Petters "Open-hardware design and characterization of an electrostatic aerosol precipitator", American Association for Aerosol Research (AAAR), Albuquerque, NM (October 2021). – Oral (virtual)
14) **Sabin Kasparoglu**, Timothy Wright, Sonia Kreidenweis, Paul J. DeMott, Paul J Ziemann, Markus D. Petters"Open-hardware design and characterization of an electrostatic aerosol precipitator", Atmospheric Radiation Measurement (ARM)/Atmospheric System Research (ASR) Joint User Facility and Principal Investigator meeting, virtual, (June 2021).
15) **Sabin Kasparoglu,** Ying Li, Manabu Shiraiwa, and Markus D. Petters "Measurements and modeling of the temperature and humidity dependent viscosity between −30 and 30 degree celsius", American Association for Aerosol Research (AAAR), Raleigh (virtual), NC (October 2020). – Oral (virtual)
16) **Sabin Kasparoglu,** Russel Perkins, Paul DeMott, Sonia Kreidenweis, and Markus D. Petters "Experimental determination of the relationship between organic aerosol viscosity and deposition mode ice nucleation at upper free tropospheric conditions", American Association for Aerosol Research (AAAR), Portland, OR (October 2019). - Poster
17) **Sabin Kasparoğlu,** Selahattin Incecik, and Sema Topcu "Variability of ozone, OX and NO_x in rural and urban areas in marmara region of turkey", 7th Symposium on Air Pollution and Control, HKK2017, Antalya, Turkey (November 2017). - Poster
18) **Sabin Kasparoğlu,** Selahattin Incecik, and Sema Topcu "Variability of ozone, OX and NO_x in rural and urban areas in marmara region of turkey", European Geosciences Union (EGU) General Assembly, Vienna, Austria (April 2017). - Poster
19) **Sabin Kasparoğlu,** Selahattin Incecik, and S., and Betul Ozer "Variations in O_3 and NO_x at coastal suburban, and urban sites in istanbul", 5th International Workshop and Conference, Particulate Matter: Research and Management, WeBIOPATR-2015, Belgrade, Serbia (October 2015). - Oral
20) **Sabin Kasparoğlu,** Selahattin Incecik, and Betul Ozer "Investigation into relationships among NO, NO_2, and O_3, at urban and rural sites in istanbul", 7th Atmospheric Sciences Symposium, Istanbul, Turkey (April 2015). - Poster

21) **Sabin Kasparoğlu,** Kardelen Kaya, Hüseyin Toros, Hasancan Okutan, Ali Deniz, and Ali Öztürk "Benzene, toluene, ethylbenzene, xylene (BTEX) measurements in istanbul kagıthane district", 5th International Symposium on Air Pollution and Control, Eskisehir, Turkey (September 2013). - Poster

Conference Abstracts (co-authors):

22) Sunandan Mahant, Emil M. Iversen, **Sabin Kasparoglu**, Merete Bilde, Markus D. Petters "Direct measurement and modeling of the viscosity of ternary aerosol mixtures" American Meteorological Society Annual meeting (AMS), Denver, CO (January 2023).
23) Nicholas Meskhidze, Ajmal Rasheeda Satheesh, **Sabin Kasparoglu,** Maksimul Islam, Bethany Sutherland and Markus D Petters. "Turbulent Flux Measurements and Transfer Velocity Estimates of Sub-10 nm Sized Particles." American Geophysical Union Fall Meeting (AGU), Chicaco, IL (December 2022).
24) Ajmal Rasheeda Satheesh, **Sabin Kasparoglu**, Bethany Sutherland, Nicholas Meskhidze, Markus Petter "Particle turbulent mass flux retrievals through novel remote sensing methodology", American Geophysical Union Fall Meeting (AGU), Chicaco, IL (December 2022).
25) **Sabin Kasparoglu**, Mohammad Maksimul Islam, Nicholas Meskhizde, Markus D. Petters "Characterization of a modified printed optical particle spectrometer for aerosol sampling systems." Annual Meeting of the Southeastern Section of the American Physical Society (SESAPS), University, MS (November 2022).
26) Ajmal Rasheeda Satheesh, **Sabin Kasparoglu**, Bethany Sutherland, Nicholas Meskhidze, Markus Petter "Particle turbulent mass flux retrievals through novel remote sensing methodology." American Association for Aerosol Research (AAAR), Raleigh, NC (October 2022).
27) Nicholas Meskhidze, Ajmal Rasheeda Satheesh, **Sabin Kasparoglu**, Mohammad Maksimul Islam, Bethany Sutherland, Markus Petters "Turbulent flux measurements and transfer velocity estimates of nucleation-sized particles." American Association for Aerosol Research (AAAR), Raleigh, NC (October 2022).
28) Paul J. DeMott, **Sabin Kasparoglu** , Russell Perkins, Paul J. Ziemann, Sonia M. Kreidenweis, Markus D. Petters "Freezing of secondary organic aerosols at upper tropospheric cloud conditions", American Geophysical Union Fall Meeting (AGU), New Orleans, LA & virtual (December 2021).
29) Markus Petters, Nicholas Rothfuss, **Sabin Kasparoglu,** Wyatt Champion, Andrew Grieshop, Paul Ziemann, Sonia Kreidenweis, Paul DeMott "Application of the dual tandem dma method to study the amorphous phase transition of organic aerosols" 2019 Joint ARM User Facility and ASR PI Meeting, Rockville, MD (June 2019).

AWARDS AND HONORS

1) Organization Committee Travel Award for Seventh air pollution control symposium-HKK2017-, Antalya, Turkey, 2017.
2) Presidential Travel Award for 5th International Workshop and Conference, Particulate Matter: Research and Management -WeBIOPATR2015, Belgrade, Serbia, 2015.
3) Secured Honor List in Chemical Eng. Department, Istanbul Technical University, 2009-13.

PROPOSALS AND GRANTS

4) Ilker Demiryol (PI) and Sabin Kasparoglu, "Halogen-free flame retardant polyurethane" project has been funded by "The scientific and technological research council of Turkey (TUBITAK)", the prestigious governmental institution in Turkey for scientific and technological research, 2016.
5) Ilker Demiryol (PI) and Sabin Kasparoglu, "Water-based polyurethane" project is awarded by jury's special award, Istanbul Technical University, Big-Bang Start-Up Challenge, 2016.

COMPUTATIONAL SKILLS

Programming language: Julia, MATLAB, R.
Software: SolidWorks, Glade Interface Designer, HYSPLIT, IDV, ChemCAD.

PROFESSIONAL AFFILIATIONS

American Association for Aerosol Research (AAAR), European Geophysical Union (EGU), American Physical Society (APS), American Geophysical Union (AGU) **EXTRA-CURRICULAR:** Armenian Engineers and Scientists of America (AESA): Served as a judge member in AESA Science Olympiad 2021 for Senior Physical Sciences (SPS) category. Member of HAYCAR, Association of Architects and Engineers since 2012.