

Curriculum Vitae

Kimberly A. Prather

Distinguished Chair in Atmospheric Chemistry
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RESEARCH SUMMARY

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

Over the course of her career, Professor Prather has authored over 270 publications in a wide range of prestigious scientific journals. Professor Prather invented aerosol time- of-flight mass spectrometry (ATOFMS) that allows one to directly measure the atmospheric evolution of aerosol particle composition. An area of focus of her research involves understanding how aerosols impact climate, air quality, and human health. Her group has been investigating the sources of airborne viruses such as SARS-CoV-2 and the impacts on human health.

She is the founding Director of the NSF Center for Aerosol Impacts on Chemistry of the Environment (CAICE), an NSF Center for Chemical Innovation. CAICE has transferred the full complexity of the ocean- atmosphere system into the laboratory to investigate how phytoplankton, bacteria, and viruses in the ocean influence atmospheric chemistry, clouds, and climate.

She is also the founding co-Director of Meta-Institute for Airborne Disease in a Changing Climate (Airborne Institute) funded by the Balvi Foundation. Airborne Institute focuses on both understanding the impact of climate change on the air we breathe, as well as developing implementable solutions to improve indoor and outdoor air quality globally.

During the COVID-19 pandemic, Professor Prather has been extremely active in science communication related to the airborne transmission of SARS-CoV-2. She has been a major spokesperson conducting thousands of media interviews that have led to the implementation of measures to protect against the spread of this airborne virus and end this pandemic. She has been involved as an expert helping develop a safe plan for re-opening San Diego Unified School district and the UC San Diego Return to Learn program.

She has received numerous accolades for her work and is an elected member of three prestigious academies: American Academy of Arts and Sciences (2010), National Academy of Engineering (2019) and National Academy of Sciences (2020). Some of her other recent awards include the 2024 National Academy of Sciences Award in Chemical Sciences, 2023 Gustavus John Esselen Award for Chemistry in the Public Interest, 2022 Pittsburgh Analytical Chemistry Award, 2020 American Chemical Society Frank H. Field & Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry, 2018 Chancellor's Associates Excellence Award in Research in Science and Engineering, 2015 Haagen-Smit Clean Air Award, the 2010 American Chemical Society Award for Creative Advances in Environmental Science & Technology. She is an elected fellow of the American Geophysical Union, the Association for the Advancement of Arts and Sciences, and the American

Philosophical Society.

EDUCATION

Postdoctoral Fellow , Y. T. Lee (advisor) University of California, Berkeley	1990-1992
Ph.D. Chemistry, R. N. Rosenfeld (advisor) University of California, Davis	1990
B.S. , Chemistry University of California, Davis	1985

ACADEMIC AND PROFESSIONAL APPOINTMENTS

2017 – Present	Distinguished Professor
2009 – Present	Founding Director, NSF Center for Aerosol Impacts on Chemistry of the Environment
2010 – Present	Distinguished Chair in Atmospheric Chemistry
2001 – Present	Professor, Dept. of Chemistry and Biochemistry, Scripps Institution of Oceanography, Univ. of Calif., San Diego,
2000 – 2001	Professor, Univ. of California, Riverside
1996 – 2000	Associate Professor, Univ. of California, Riverside
1992 – 1996	Assistant Professor, Univ. of California, Riverside

LIST OF HONORS AND AWARDS

2025	American Association for Aerosol Research, Susanne V. Hering Award
2025	Women in Chemistry Trailblazer Award by the Women Chemists Committee of the San Diego Local Section of the American Chemical Society (September 19, 2025)
2025	The County of San Diego issued a proclamation declaring September 9, 2025 “Kim Prather and Paula Stigler Granados Day”
2024	National Academy of Sciences Award in Chemical Sciences
2024-2025	Vice Chair, Peer Committee, Special Fields and Interdisciplinary Engineering, National Academy of Engineering
2023-2026	Peer Committee, Special Fields and Interdisciplinary Engineering, National Academy of Engineering
2023	Gustavus John Esselen Award for Chemistry in the Public Interest
2022	Pittsburgh Analytical Chemistry Award (PACA)
2022	Elected, American Philosophical Society
2021-2022	AGU College of Fellows Distinguished Lecturer
2020	Elected, National Academy of Sciences
2020	ACS Frank H. Field and Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry
2019	Elected, National Academy of Engineering:
2019	NSF Big Idea Finalist (top 33): Global Microbiome in a Changing Climate (used to guide research over the next decade)
2019	Top 100 Power List, Analytical Scientist
2018	Chancellor’s Associates Excellence Award in Research in Science and Engineering
2017	Top 10 Public Defenders (Scientists Protecting People and the Planet), Analytical Scientist
2017	Virtual Issue in Honor of the 150th Birthday of Marie Curie: Highlighting Female Physical Chemists

2016	Top 50 Women in the Analytical Sciences, The Analytical Scientist Power List of World Leaders
2016	Philip B. Hopke Inaugural Lecture, Clarkson University
2015	#1 “Environmental Science” publication in Environmental Science and Technology
2015	Haagen-Smit Clean Air Award
2014	UC San Diego Faculty Research Lecturer
2012	American Chemical Society Eminent Scientist Lecturer
2011	American Chemical Society, San Diego, Distinguished Scientist of the Year
2010	ACS Award for Creative Advances in Environmental Science & Technology
2010	Elected Fellow, American Academy of Arts and Sciences
2010	Elected Fellow, American Association for the Advancement for Science
2009	Elected Fellow, American Geophysical Union
2000	Arthur F. Findeis Award (Analytical Chemistry Division/American Chemical Society)
2000	R&D Magazine Top 100 Invention Awards
1999	UC CONNECT Most Innovative New Product Award (ATOFMS)
1999	Kenneth T. Whitby Award (American Association for Aerosol Research)
1998	Smoluchowski Award (GaeF, German Aerosol Society)
1997	Special Creativity Award, National Science Foundation
1994	American Society for Mass Spectrometry Research Award
1994	National Science Foundation Young Investigator Award

SYNERGISTIC ACTIVITIES

2025-2026	Chair, NAE Special Fields & Interdisciplinary Engineering Peer Committee
2025-2026	Member, NAE Committee on Membership (CoM) for the 2026 Election
2022-present	Co-Founding Director of Meta-Institute for Airborne Disease in a Changing Climate (Airborne Institute)
2010-present	Founding Director of the NSF Center for Aerosol Impacts on Chemistry of the Environment (CAICE)
2022	OSHA Testimony on Importance of Proper PPE for Healthcare Workers
2021-2022	Member, NASEM Committee on the Health Risks of Indoor Exposures to Fine Particulate Matter and Practical Mitigation Solutions
2020-2021	Member, NASEM Committee on Indoor Exposure to Fine Particulate Matter and Practical Mitigation Approaches
2020-2021	NASEM Emerging Science on Indoor Chemistry
2020-2021	Max Planck Institute for Chemistry, Scientific Advisory Board
2020	SARS-CoV-2 Science Communication: Wrote Science Perspective on “Airborne Transmission of SARS-CoV-2” summarizing the airborne nature of this virus and the importance of masks for reducing the spread. Since being published in May of 2020, it has been downloaded ~1.6M times, the most downloads of any Science piece in history.
2020	Co-organizer and session moderator, National Academies virtual workshop on the “Airborne Transmission of SARS-CoV-2”, Environmental Health Matters Initiative.
2020	NAS Awards Committee
2009-2018	Co-chief scientist of CalWater study focusing on aerosol impacts on the hydrological cycle and Atmospheric Rivers.
2017	Member of NCAR/ACOM Blue Ribbon Review Panel
2017-2020	American Geophysical Union (AGU) Fellows Committee 2017-2019 ACS National Award Selection Committee
2018-2019	American Academy Fellow Selection Committee
2017-2020	Advisory Board for National Center for Atmospheric Research (NCAR/ACOM) 2017

2016	Chaired and organized Gordon Research Conference on “Atmospheric Chemistry”. Co-author of National Academies Report "The Future of Atmospheric Chemistry Research"
2016	Co-chaired Committee of Visitors to AGS at NSF
2016	Co-organizer of National Academies Sackler Symposium on “Improving our fundamental understanding of the role of aerosol–cloud interactions in the climate system”.
2009-2015	Member for two terms on the National Academy of Sciences Board for Atmospheric Science and Climate (BASC).
2013-2015	External advisor to the Associate Director of Geosciences at the National Science Foundation.

INNOVATIONS IN ENVIRONMENTAL CHEMISTRY

Five patents for developments in on-line mass spectrometry for environmental chemistry lab and field studies:

1. Aerosol time-of-flight mass spectrometry (ATOFMS) (US Patent 5,681,752)
2. Development of transportable ATOFMS (US Patent 5,998,215)
3. MALDI-IM-ortho-TOF Mass Spectrometry with Simultaneous Positive and Negative Mode Detection (US Patent: 7,170,052)
4. Compact Aerosol Time- of-Flight Mass Spectrometer (US Patent: 8,648,294)
5. Biological Cell Sorting and Characterization Using Aerosol Mass Spectrometry (US Patent: 8,626,449)

FUNDING SOURCES

National Science Foundation, California Air Resources Board, California Energy Commission, National Cancer Institute, National Oceanic and Atmospheric Administration, Department of Energy, Pacific Northwest National Laboratory, and Balvi Foundation.

PUBLIC SERVICE

Dedicates significant time educating the public on climate and air pollution issues by giving lectures at the SIO Birch Aquarium, San Diego Natural History Museum, radio (NPR), TV broadcasts (CBS, NBC, ABC, KPBS, CNN), local schools. She and members of her research group are heavily involved in science communication. Highlights of her research have appeared in the popular press including the LA Times, CBS Evening News, Discover, Scientific American, Al Jazeera, CNN, PBS, and National Geographic.

During the pandemic, Prather has been heavily involved in helping local San Diego K-12 schools and UC San Diego reopen safely by considering the airborne transmission of the SARS-CoV-2 virus. She has now conducted thousands of national and international media interviews on how to protect oneself from airborne exposure to this virus. She was involved in writing a FAQ that has been translated into numerous languages and used worldwide on “How to protect yourself from SARS-CoV-2” that has been widely distributed.

CONTRIBUTIONS TO EDUCATION IN ENVIRONMENTAL CHEMISTRY

Prather has graduated 40 PhD students and mentored hundreds of undergraduates. She teaches courses on Instrument Development, Environmental Chemistry, Chemistry and Climate, and Atmospheric Aerosols. She works extensively with graduate students and postdocs on effective science

communication, as well as how to design and build scientific instrumentation to address complex environmental chemistry problems. Through CAICE, she has developed new curricula for K-12 science education and "Traveling Trunks" used to educate K-12 students on climate and atmospheric chemistry. These trunks are being used all over the United States, as well as Mexico, and in several tribal nations.

SELECT CHEMISTRY GRADUATE STUDENTS (GS) and POSTDOCS (PD)

Kerri Pratt (Assoc. Prof.; Univ. of Michigan; GS), Andrew Ault (Asst. Prof.; Univ. of Michigan; GS), Deborah Gross (Professor; Carleton College; PD), Doug Collins (Asst. Prof. Bucknell Univ., GS); Jack Cahill (Research Scientist, Oak Ridge National Labs, GS); Sergio Guazzotti (Manager, Thermo Fisher, GS/PD); Markus Gaelli (Research Scientist; TSI, Inc.; PD), Cassandra Gaston (Asst. Prof.; University of Miami; GS), Ryan Sullivan (Asst. Prof.; Carnegie Mellon University; GS), Eric Gard (Research Director; LLNL; PD), Jessie Creamean (Research Scientist; Colorado State; GS)

PUBLICATIONS

1. Weiner, B. R.; Pasternack, L.; Nelson, H. H.; Prather, K. A.; Rosenfeld, R. N., Photodissociation Dynamics of BH_3CO at 193-nm. *Journal of Physical Chemistry* **1990**, 94 (10), 4138-4142.
2. Prather, K. A.; Rosenfeld, R. N., Photodissociation Dynamics of 3-Cyclopentenone Using a Tunable Diode-Laser. *Journal of Physical Chemistry* **1991**, 95 (17), 6544-6548.
3. Prather, K. A.; Lee, Y. T., Primary Processes Involved in the Photodissociation of Saturated-hydrocarbons at 157 nm. *Optical Methods for Time and State-Resolved Chemistry* **1992**, 1638, 179-184.
4. Prather, K. A.; Lee, Y. T., The Photodissociation of Pyridine at 193-nm. *Israel Journal of Chemistry* **1994**, 34 (1), 43-53.
5. Noble, C. A.; Nordmeyer, T.; Salt, K.; Morrical, B.; Prather, K. A., Aerosol Characterization Using Mass-Spectrometry. *TRAC-Trends in Analytical Chemistry* **1994**, 13 (5), 218-222.
6. Prather, K. A.; Nordmeyer, T.; Salt, K., Real-Time Characterization of Individual Aerosol- Particles Using Time-of-Flight Mass-Spectrometry. *Analytical Chemistry* **1994**, 66 (9), 1403-1407.
7. Nordmeyer, T.; Prather, K. A., Real-Time Measurement Capabilities Using Aerosol Time- of-Flight Mass-Spectrometry. *Analytical Chemistry* **1994**, 66 (20), 3540-3542.
8. Salt, K.; Noble, C. A.; Prather, K. A., Aerodynamic Particle Sizing Versus Light Scattering Intensity Measurement as Methods for Real Time Particle Sizing Coupled with Time-of- Flight Mass Spectrometry. *Analytical Chemistry* **1996**, 68 (1), 230-234.
9. Noble, C. A.; Prather, K. A., Real-Time Measurement of Correlated Size and Composition Profiles of Individual Atmospheric Aerosol Particles. *Environmental Science & Technology* **1996**, 30 (9), 2667-2680.
10. Fergenson, D. P.; Liu, D. Y.; Silva, P. J.; Prather, K. A., Spectrasort: A Data Analysis Program for Real-Time Aerosol Analysis by Aerosol Time-of-Flight Mass Spectrometry. *Chemometrics and Intelligent Laboratory Systems* **1997**, 37 (1), 197-203.
11. Liu, D. Y.; Rutherford, D.; Kinsey, M.; Prather, K. A., Real-Time Monitoring of Pyrotechnically Derived Aerosol Particles in the Troposphere. *Analytical Chemistry* **1997**, 69 (10), 1808-1814.
12. Gard, E.; Mayer, J. E.; Morrical, B. D.; Dienes, T.; Fergenson, D. P.; Prather, K. A., Real- Time Analysis of Individual Atmospheric Aerosol Particles: Design and Performance of a Portable ATOFMS. *Analytical Chemistry* **1997**, 69 (20), 4083-4091.

13. Silva, P. J.; Prather, K. A., On-Line Characterization of Individual Particles from Automobile Emissions. *Environmental Science & Technology* **1997**, 31 (11), 3074-3080.
14. Noble, C. A.; Prather, K. A., Real-Time Single Particle Monitoring of a Relative Increase in Marine Aerosol Concentration During Winter Rainstorms. *Geophysical Research Letters* **1997**, 24 (22), 2753-2756.
15. Noble, C. A.; Prather, K. A., Aerosol Time-of-Flight Mass Spectrometry: A New Method for Performing Real-Time Characterization of Aerosol Particles. *Applied Occupational and Environmental Hygiene* **1998**, 13 (6), 439-443.
16. Noble, C.; Prather, K., Air Pollution: The Role of Particles. *Physics World* **1998**, 11 (1), 39- 43.
17. Gard, E. E.; Kleeman, M. J.; Gross, D. S.; Hughes, L. S.; Allen, J. O.; Morrical, B. D.; Fergenson, D. P.; Dienes, T.; Galli, M. E.; Johnson, R. J.; Cass, G. R.; Prather, K. A., Direct Observation of Heterogeneous Chemistry in the Atmosphere. *Science* **1998**, 279 (5354), 1184-1187.
18. Wood, S. H.; Prather, K. A., Time-of-Flight Mass Spectrometry Methods for Real Time Analysis of Individual Aerosol Particles. *Trac-Trends in Analytical Chemistry* **1998**, 17 (6), 346-356.
19. Noble, C. A.; Prather, K. A., Single Particle Characterization of Albuterol Metered Dose Inhaler Aerosol in near Real-Time. *Aerosol Science and Technology* **1998**, 29 (4), 294-306.
20. Morrical, B. D.; Fergenson, D. P.; Prather, K. A., Coupling Two-Step Laser Desorption/Ionization with Aerosol Time-of-Flight Mass Spectrometry for the Analysis of Individual Organic Particles. *Journal of the American Society for Mass Spectrometry* **1998**, 9 (10), 1068-1073.
21. Song, X. H.; Hopke, P. K.; Fergenson, D. P.; Prather, K. A., Classification of Single Particles Analyzed by ATOFMS Using an Artificial Neural Network, Art-2a. *Analytical Chemistry* **1999**, 71 (4), 860-865.
22. Suess, D. T.; Prather, K. A., Mass Spectrometry of Aerosols. *Chemical Reviews* **1999**, 99 (10), 3007-3036.
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26. Gross, D. S.; Galli, M. E.; Silva, P. J.; Wood, S. H.; Liu, D. Y.; Prather, K. A., Single Particle Characterization of Automobile and Diesel Truck Emissions in the Caldecott Tunnel. *Aerosol Science and Technology* **2000**, 32 (2), 152-163.
27. Gross, D. S.; Galli, M. E.; Silva, P. J.; Prather, K. A., Relative Sensitivity Factors for Alkali Metal and Ammonium Cations in Single Particle Aerosol Time-of-Flight Mass Spectra. *Analytical Chemistry* **2000**, 72 (2), 416-422.
28. Allen, J. O.; Fergenson, D. P.; Gard, E. E.; Hughes, L. S.; Morrical, B. D.; Kleeman, M. J.; Gross, D. S.; Galli, M. E.; Prather, K. A.; Cass, G. R., Particle Detection Efficiencies of Aerosol Time of Flight Mass Spectrometers under Ambient Sampling Conditions. *Environmental Science & Technology* **2000**, 34 (1), 211-217.
29. Liu, D. Y.; Prather, K. A.; Hering, S. V., Variations in the Size and Chemical Composition of Nitrate-Containing Particles in Riverside, CA. *Aerosol Science and*

- Technology* **2000**, 33 (1-2), 71-86.
30. Silva, P. J.; Prather, K. A., Interpretation of Mass Spectra from Organic Compounds in Aerosol Time-of-Flight Mass Spectrometry. *Analytical Chemistry* **2000**, 72 (15), 3553-3562.
 31. Hughes, L. S.; Allen, J. O.; Bhave, P.; Kleeman, M. J.; Cass, G. R.; Liu, D. Y.; Fergenson, D. F.; Morrical, B. D.; Prather, K. A., Evolution of Atmospheric Particles Along Trajectories Crossing the Los Angeles Basin. *Environmental Science & Technology* **2000**, 34 (15), 3058- 3068.
 32. Noble, C. A.; Prather, K. A., Real-Time Single Particle Mass Spectrometry: A Historical Review of a Quarter Century of the Chemical Analysis of Aerosols. *Mass Spectrometry Reviews* **2000**, 19 (4), 248-274.
 33. Lelieveld, J.; Crutzen, P. J.; Ramanathan, V.; Andreae, M. O.; Brenninkmeijer, C. A. M.; Campos, T.; Cass, G. R.; Dickerson, R. R.; Fischer, H.; de Gouw, J. A.; Hansel, A.; Jefferson, A.; Kley, D.; de Laat, A. T. J.; Lal, S.; Lawrence, M. G.; Lobert, J. M.; Mayol-Bracero, O. L.; Mitra, A. P.; Novakov, T.; Oltmans, S. J.; Prather, K. A.; Reiner, T.; Rodhe, H.; Scheeren, H. A.; Sikka, D.; Williams, J., The Indian Ocean Experiment: Widespread Air Pollution from South and Southeast Asia. *Science* **2001**, 291 (5506), 1031-1036.
 34. Galli, M.; Guazzotti, S. A.; Prather, K. A., Improved Lower Particle Size Limit for Aerosol Time-of-Flight Mass Spectrometry. *Aerosol Science and Technology* **2001**, 34 (4), 381-385.
 35. Bhave, P. V.; Fergenson, D. P.; Prather, K. A.; Cass, G. R., Source Apportionment of Fine Particulate Matter by Clustering Single-Particle Data: Tests of Receptor Model Accuracy. *Environmental Science & Technology* **2001**, 35 (10), 2060-2072.
 36. Guazzotti, S. A.; Whiteaker, J. R.; Suess, D.; Coffee, K. R.; Prather, K. A., Real-Time Measurements of the Chemical Composition of Size-Resolved Particles During a Santa Ana Wind Episode, California USA. *Atmospheric Environment* **2001**, 35 (19), 3229-3240.
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 38. Guazzotti, S. A.; Coffee, K. R.; Prather, K. A., Continuous Measurements of Size-Resolved Particle Chemistry During INDOEX-Intensive Field Phase 99. *Journal of Geophysical Research-Atmospheres* **2001**, 106 (D22), 28607-28627.
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 40. Ramanathan, V.; Crutzen, P. J.; Lelieveld, J.; Mitra, A. P.; Althausen, D.; Anderson, J.; Andreae, M. O.; Cantrell, W.; Cass, G. R.; Chung, C. E.; Clarke, A. D.; Coakley, J. A.; Collins, W. D.; Conant, W. C.; Dulac, F.; Heintzenberg, J.; Heymsfield, A. J.; Holben, B.; Howell, S.; Hudson, J.; Jayaraman, A.; Kiehl, J. T.; Krishnamurti, T. N.; Lubin, D.; McFarquhar, G.; Novakov, T.; Ogren, J. A.; Podgorny, I. A.; Prather, K.; Priestley, K.; Prospero, J. M.; Quinn, P. K.; Rajeev, K.; Rasch, P.; Rupert, S.; Sadourny, R.; Satheesh, S. K.; Shaw, G. E.; Sheridan, P.; Valero, F. P. J., Indian Ocean Experiment: An Integrated Analysis of the Climate Forcing and Effects of the Great Indo-Asian Haze. *Journal of Geophysical Research-Atmospheres* **2001**, 106 (D22), 28371-28398.
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3130-3138.

42. Fergenson, D. P.; Song, X. H.; Ramadan, Z.; Allen, J. O.; Hughes, L. S.; Cass, G. R.; Hopke, P. K.; Prather, K. A., Quantification of ATOFMS Data by Multivariate Methods. *Analytical Chemistry* **2001**, 73 (15), 3535-3541.
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47. Pastor, S. H.; Allen, J. O.; Hughes, L. S.; Bhave, P.; Cass, G. R.; Prather, K. A., Ambient Single Particle Analysis in Riverside, California by Aerosol Time-of-Flight Mass Spectrometry During the SCOS97-NARSTO. *Atmospheric Environment* **2003**, 37, S239- S258.
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- M.; Russell, L. M.; Merrill, J. T., Marine Boundary Layer Dust and Pollutant Transport Associated with the Passage of a Frontal System over Eastern Asia. *Journal of Geophysical Research-Atmospheres* **2004**, 109 (D19).
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