Jan Kazil

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SUMMARY

Embarking on a journey of discovery in atmospheric science for over 15 years, my professional trajectory reflects an unwavering passion for pushing the boundary of understanding Earth's atmosphere and climate. From exploring the role of sulfur chemistry and aerosols for Earth's radiative budget with global simulations, quantifying the cloud response to climate change in high resolution simulations, to leading meteorological forecast teams, designing mission strategies, and serving as a flight scientist in field missions, my enthusiasm fuels a diverse skill set in atmospheric science. As a lead investigator, I have secured $1.3 million in grants, contributing significantly to projects like the Atlantic Tradewind Ocean-atmosphere Mesoscale Interaction Campaign (ATOMIC). For scientific achievement in the design and implementation of ATOMIC, I was recognized with the CIRES Bronze Medal, highlighting my commitment to excellence in scientific discovery. I have the honor of contributing to national and international panels and committees, including the American Meteorological Society's Committee on Cloud Physics.

STATISTICS

ResearcherID: B-7652-2013
Publications: 39 peer reviewed
Citations without self-citations: 1409 (39 per peer-reviewed publication)
h index: 21
Grants as a lead investigator: $1.3M

PROFESSIONAL HISTORY

University of Colorado, CIRES, and NOAA CSL, Boulder, CO, USA
Senior Scientist *since 05/2024*
Scientist III 05/2015 - 04/2024
Scientist II 12/2008 - 04/2015

Max Planck Institute for Meteorology, Hamburg, Germany
Research Scientist 08/2007 – 11/2008

University of Colorado, CIRES, and NOAA CSD, Boulder, CO, USA
CIRES Scientist I 03/2007 - 07/2007

National Research Council and NOAA, Boulder, CO, USA
Research Associate 03/2006 - 02/2007

University of Colorado, CIRES, and NOAA CSD, Boulder, CO, USA
Scientist I 01/2005 – 02/2006

National Center for Atmospheric Research, Boulder, CO, USA
NCAR Advanced Study Program Postdoctoral Fellow 11/2002 - 10/2004

University of Bern, Institute of Physics, Bern, Switzerland
Postdoctoral Fellow 07/2002 - 10/2002

EDUCATION

University of Bern, Physics Institute, Bern, Switzerland
PhD, Atmospheric Science 2002

University of Bern, Institute of Theoretical Physics, Bern, Switzerland
MSc, Theoretical Physics, Mathematics, and Astronomy 1998

SKILLS AND EXPERIENCE

- Meteorological Forecast Team Lead (2023 AEROMMA mission)
- Flight Scientist (2020 ATOMIC mission)
- Large Eddy Simulations – warm phase clouds, aerosol-cloud interactions, cloud response to climate change
- Regional Air Quality Modeling - per- and poly-fluorinated alkyl substances
- Global Simulations – sulfur chemistry, aerosol-cloud interactions, Earth's radiative budget
- Supercomputing Applications – high performance parallel computing
- Machine Learning – AI methods for satellite data analysis

FUNDED PROJECTS

Lead investigator

2019–	Shallow cumulus convection in the Tropical Atlantic Ocean: Controls, responses, and mechanisms, NOAA Climate Variability and Predictability Program	$498'479
2016–2017	A novel approach to quantifying the cloud radiative effect in a changing climate using a statistical emulator, NOAA High Performance Computing and Communications Program	$103'259
2012–2015	An Investigation of Aerosol-Cloud-Precipitation Interactions in the South-East Pacific Using DOE G-1 Data and WRF/Chem Large Eddy Simulations, DOE Atmospheric Systems Research Program	$344'000
2009–2011	Natural and anthropogenic gas phase emissions and cloud properties in the South-East Pacific region, NOAA Atmospheric Composition and Climate Program/National Science Foundation	$345'000

Co-Investigator and collaborator

2024– Impacts of Aerosol Emissions Variability on Multiannual-to-Decadal Climate Predictability, NOAA Climate Program Office, PI: Dr. Geeta Persad, University of Texas

2023–2025 Advancing aerosol retrievals in the vicinity of clouds through remote sensing, 3-D radiative transfer, and state-of-the-art cloud modeling, NOAA Climate Program Office, PIs: Dr. Graham Feingold, NOAA, and Dr. Christine Chiu, Colorado State University

HONORS AND AWARDS

- University of Colorado Cooperative Institute for Research in Environmental Sciences (CIRES) Bronze Medal for "For scientific achievement in the design and implementation of the complex Atlantic Tradewind Ocean-atmosphere Mesoscale Interaction Campaign (ATOMIC)" (2023)
- American Geophysical Union Editors' Citation for Excellence in Refereeing, Geophysical Research Letters (2014)
- National Research Council (NRC) Research Associate (2006–2007)
- National Center for Atmospheric Research (NCAR) Advanced Study Program (ASP) Postdoctoral Fellow (2002–2004)

PROFESSIONAL SERVICE

Committees

- Committee on Cloud Physics, American Meteorological Society (2019 –)

Review panels

- U.S. Department of Energy (DOE), 2013, 2021
- Israel Science Foundation, 2018
- U.S. National Aeronautics and Space Administration (NASA), 2016
- U.S. National Science Foundation (NSF), 2015
- Swiss National Science Foundation, 2016, 2018, 2019
- European Co-operation in the Field of Science and Technology (COST), 2013
- U.S. National Oceanic and Atmospheric Administration (NOAA) Climate Program, 2013

PUBLICATIONS

1. Segregation of fast-reactive species in atmospheric turbulent flow, G. P. Brasseur, M. Barth, J. Kazil, E. G. Patton, and Y. Wang, Atmosphere, 14, 1136-1151, doi:10.3390/atmos14071136, 2023

2. The sugar-to-flower shallow cumulus transition under the influences of diel cycle and free-tropospheric mineral dust, P. Narenpitak, J. Kazil, T. Yamaguchi, P. K. Quinn, and G. Feingold, J. Adv. Model. Earth Syst., doi:10.1029/2022MS003228, 2023
3. Projecting stratocumulus transitions on the albedo-cloud fraction relationship reveals linearity of albedo to droplet concentrations, T. Goren, G. Feingold, E. Gryspeerdt, J. Kazil, J. Kretzschmar, H. L. Jia, and J. Quaas, Geophys. Res. Lett., doi:10.1029/2022GL101169, 2022
4. Cloud adjustments from large-scale smoke-circulation interactions strongly modulate the southeastern Atlantic stratocumulus-to-cumulus transition, M. S. Diamond, P. E. Saide, P. Zuidema, A. S. Ackerman, S. J. Doherty, A. M. Fridlind, H. Gordon, C. Howes, J. Kazil, T. Yamaguchi, J-H. Zhang, G. Feingold, and R. Wood, Atmos. Chem. Phys., doi:10.5194/acp-22-12113-2022, 2022
5. Segmentation-based multi-pixel cloud optical thickness retrieval using a convolutional neural network, V. Nataraja, S. Schmidt, H. Chen, T. Yamaguchi, J. Kazil, G. Feingold, K. Wolf, and H. Iwabuchi, Atm. Meas. Tech., doi:10.5194/amt-15-5181-2022, 2022
6. Realism of Lagrangian large eddy simulations driven by reanalysis meteorology: tracking a pocket of open cells under a biomass burning aerosol layer, J. Kazil, M. W. Christensen, S. J. Abel, T. Yamaguchi, and G. Feingold, J. Adv. Model. Earth Syst., doi:10.1029/2021MS002664, 2021
7. From sugar to flowers: a transition of shallow cumulus organization during ATOMIC, P. Narenpitak, J. Kazil, T. Yamaguchi, P. Quinn, and G. Feingold, J. Adv. Model. Earth Syst., doi:10.1029/2021MS002619, 2021
8. EUREC^{4}A, B. Stevens, S. Bony, D. Farrell, F. Ament, A. Blyth, C. Fairall, et al., Earth Sys. Sci. Data, doi:10.5194/essd-13-4067-2021, 2021
9. Observations from the NOAA P-3 aircraft during ATOMIC, R. Pincus, C. W. Fairall, A. Bailey, H. N. Chen, P. Y. Chuang, G. de Boer, G. Feingold, D. Henze, Q. T. Kalen, J. Kazil, M. Leandro, A. Lundry, K. Moran, D. A. Naeher, D. Noone, A. J. Patel, S. Pezoa, I. PopStefanija, E. J. Thompson, J. Warnecke, and P. Zuidema, Earth Sys. Sci. Data, doi:10.5194/essd-13-3281-2021, 2021
10. Large hemispheric difference in nucleation mode aerosol concentrations in the lowermost stratosphere at mid- and high latitudes, A. Kupc, C. J. Williamson, A. L. Hodshire, J. Kazil, E. Ray, T. P. Bui, M. Dollner, K. D. Froyd, K. McKain, A. Rollins, G. P. Schill, A. Thames, B. B. Weinzierl, J. R. Pierce, and C. A. Brock, Atmos. Chem. Phys., doi:10.5194/acp-21-9065-2021, 2021
11. The potential role of organics in new particle formation and initial growth in the remote tropical upper troposphere, A. Kupc, C. J. Williamson, A. L. Hodshire, J. Kazil, E. Ray, T. P. Bui, M. Dollner, K. D. Froyd, K. McKain, A. Rollins, G. P. Schill, A. Thames, B. B. Weinzierl, J. R. Pierce, and C. A. Brock, Atmos. Chem. Phys., doi:10.5194/acp-20-15037-2020, 2020

12. Anthropogenic air pollution delays marine stratocumulus breakup to open cells, T. Goren, J. Kazil, F. Hoffmann, T. Yamaguchi, and G. Feingold, Geophys. Res. Lett., doi:10.1029/2019GL085412, 2019
13. Aerosol-cloud interactions in trade wind cumulus clouds and the role of vertical wind shear, T. Yamaguchi, G. Feingold, and J. Kazil, J. Geophys. Res., doi:10.1029/2019JD031073, 2019
14. Analysis of albedo versus cloud fraction relationships in liquid water clouds using heuristic models and large eddy simulation, G. Feingold, J. Balsells, F. Glassmeier, T. Yamaguchi, J. Kazil, and A. McComiskey, J. Geophys. Res., doi:10.1002/2017JD026467, 2017
15. Stratocumulus to cumulus transition by drizzle, T. Yamaguchi, G. Feingold, and J. Kazil, J. Adv. Model. Earth Syst., 9, doi:10.1002/2017MS001104, 2017
16. Mesoscale organization, entrainment, and the properties of a closed-cell stratocumulus cloud, J. Kazil, T. Yamaguchi, and G. Feingold, J. Adv. Model. Earth Syst., 9, doi:10.1002/2017MS001072, 2017
17. Wind speed response of marine non-precipitating stratocumulus clouds over a diurnal cycle in cloud-system resolving simulations, J. Kazil, G. Feingold, and T. Yamaguchi, Atmos. Chem. Phys., 16, 5811-5839, doi:10.5194/acp-16-5811-2016, 2016
18. Stratocumulus to cumulus transition in the presence of elevated smoke layers, T. Yamaguchi, G. Feingold, J. Kazil, and A. McComiskey, Geophys. Res. Lett., 42, 10478–10485, doi:10.1002/2015GL066544, 2015
19. On the reversibility of transitions between closed and open cellular convection, G. Feingold, I. Koren, T. Yamaguchi, and J. Kazil, Atmos. Chem. Phys., 15, 7351-7367, doi:10.5194/acp-15-7351-2015, 2015
20. Deposition and rainwater concentrations of trifluoroacetic acid in the United States from the use of HFO-1234yf, J. Kazil, S. McKeen, S.-W. Kim, R. Ahmadov, G. A. Grell, R. K. Talukdar, and A. R. Ravishankara, J. Geophys. Res., 109, D19206, doi:10.1002/2014jd022058, 2014
21. On the interaction between marine boundary layer cellular cloudiness and surface heat fluxes, J. Kazil, G. Feingold, H. Wang, and T. Yamaguchi, Atmos. Chem. Phys., 14, 61-79, doi:10.5194/acp-14-61-2014, 2014
22. Numerical issues associated with compensating and competing processes in climate models: an example from ECHAM-HAM, H. Wan, P. J. Rasch, K. Zhang, J. Kazil, L. R. Leung, Geosci. Model Dev., 6, 861–874, doi:10.5194/gmd-6-861-2013, 2013
23. The present-day decadal solar cycle modulation of Earth's radiative forcing via charged H_2SO_4/H_2O aerosol nucleation, J. Kazil, K. Zhang, P. Stier, J. Feichter, U. Lohmann, and K. O'Brien, Geophys. Res. Lett., 39, L02805, doi:10.1029/2011GL050058, 2012
24. The regional aerosol-climate model REMO-HAM, J.-P. Pietikäinen, D. O'Donnell, C. Teichmann, U. Karstens, S. Pfeifer, J. Kazil, R. Podzun, S. Fiedler, H. Kokkola, W. Birmili, C. O'Dowd, U. Baltensperger, E. Weingartner, R. Gehrig, G. Spindler, M.

Kulmala, J. Feichter, D. Jacob, and A. Laaksonen, Geosci. Model Dev., 5, 1323-1339, doi:10.5194/gmd-5-1323-2012, 2012

25. The global aerosol-climate model ECHAM-HAM, version 2: sensitivity to improvements in process representations, K. Zhang, D. O'Donnell, J. Kazil, P. Stier, S. Kinne, U. Lohmann, S. Ferrachat, B. Croft, J. Quaas, H. Wan, S. Rast, and J. Feichter, Atmos. Chem. Phys., 12, 8911-8949, doi:10.5194/acp-12-8911-2012, 2012
26. In situ observations of new particle formation in the tropical upper troposphere: the role of clouds and the nucleation mechanism, R. Weigel, S. Borrmann, J. Kazil, A. Minikin, A. Stohl, J. C. Wilson, J. M. Reeves, D. Kunkel, M. de Reus, W. Frey, E. R. Lovejoy, C. M. Volk, S. Viciani, F. D'Amato, C. Schiller, T. Peter, H. Schlager, F. Cairo, K. S. Law, G. N. Shur, G. V. Belyaev, and J. Curtius, Atmos. Chem. Phys., 11, 9983-10010, doi:10.5194/acp-11-9983-2011, 2011
27. Radon activity in the lower troposphere and its impact on ionization rate: a global estimate using different radon emissions, K. Zhang, J. Feichter, J. Kazil, H. Wan, W. Zhuo, A. D. Griffiths, H. Sartorius, W. Zahorowski, M. Ramonet, M. Schmidt, C. Yver, R. E. M. Neubert, E.-G. Brunke, Atmos. Chem. Phys., 11, 7817–7838, doi:10.5194/acp-11-7817-2011, 2011
28. Modeling chemical and aerosol processes in the transition from closed to open cells during VOCALS-REx, J. Kazil, H. Wang, G. Feingold, A. D. Clarke, J. R. Snider, and A. R. Bandy, Atmos. Chem. Phys., 11, 7491–7514, doi:10.5194/acp-11-7491-2011, 2011
29. Modelling microphysical and meteorological controls on precipitation and cloud cellular structures in Southeast Pacific stratocumulus, H. Wang, G. Feingold, R. Wood, and J. Kazil, Atmos. Chem. Phys., 10, 6347–6362, doi:10.5194/acp-10-6347-2010, 2010
30. Aerosol nucleation and its role for clouds and Earth's radiative forcing in the aerosol-climate model ECHAM5-HAM, J. Kazil, P. Stier, K. Zhang, J. Quaas, S. Kinne, D. O'Donnell, S. Rast, M. Esch, S. Ferrachat, U. Lohmann, and J. Feichter, Atmos. Chem. Phys., 10, 10733–10752, doi:10.5194/acp-10-10733-2010, doi:10.5194/acp-10-10733-2010, 2010
31. Aerosol microphysics modules in the framework of the ECHAM5 climate model – intercomparison under stratospheric conditions, H. Kokkola, R. Hommel, J. Kazil, U. Niemeier, A.-I. Partanen, J. Feichter, and C. Timmreck, Geosci. Model Dev., 2, 97–112, doi:10.5194/gmd-2-97-2009, 2009
32. Tropospheric new particle formation and the role of ions, J. Kazil, R. G. Harrison, and E. R. Lovejoy, Space Sci. Rev., 137, 241–255, doi:10.1007/978-0-387-87664-1_15, 2008
33. Relevance of ion-induced nucleation of sulfuric acid and water in the lower troposphere over the boreal forest at northern latitudes, M. Boy, J. Kazil, E. R. Lovejoy, A. Guenther, and M. Kulmala, Atmos. Res., 90, 151-158, 2008
34. Hot-air balloon as a platform for boundary layer profile measurements during particle formation, L. Laakso, T. Grönholm, L. Kulmala, S. Haapanala, A. Hirsikko, E. R.

Lovejoy, J. Kazil, T. Kurtén, M. Boy, E. D. Nilsson, A. Sogachev, I. Riipinen, F. Stratmann, and M. Kulmala, Boreal Env. Res., 12, 279–294, 2007

35. A semi-analytical method for calculating rates of new sulfate aerosol formation from the gas phase, J. Kazil, and E. R. Lovejoy, Atmos. Chem. Phys., 7, 3447–3459, doi:10.5194/acp-7-3447-2007, 2007
36. Is aerosol formation in cirrus clouds possible?, J. Kazil, E. R. Lovejoy, E. J. Jensen, and D. R. Hanson, Atmos. Chem. Phys. 7, 1407–1413, doi:10.5194/acp-7-1407-2007, 2007
37. Aerosol nucleation over oceans and the role of galactic cosmic rays, J. Kazil, E. R. Lovejoy, M. C. Barth, and K. O'Brien, Atmos. Chem. Phys., 6, 2006
38. Tropospheric ionization and aerosol production: A model study, J. Kazil, and E. R. Lovejoy, J. Geophys. Res., 109, D19206, doi:10.5194/acp-6-4905-2006, 2004
39. The University of Bern Atmospheric Ion Model: Time-dependent, modeling of the ions in the mesosphere and lower thermosphere, J. Kazil, E. Kopp, S. Chabrillat, and J. Bishop, J. Geophys. Res., 108, D14, 4432, doi:10.1029/2002JD003024, 2003