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 over $1.29 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.

PROFESSIONAL EMPLOYMENT

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

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

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

National Center for Atmospheric Research (NCAR), 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

PROFESSIONAL EXPERIENCE

- Meteorological Forecast Team Lead (AEROMMA mission)
- Flight Scientist (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

2019–2021	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)
- National Research Council (NRC) Research Associate (2006–2007)
- National Center for Atmospheric Research (NCAR) Advanced Study Program (ASP) Postdoctoral Fellow (2002–2004)
- American Geophysical Union Editors' Citation for Excellence in Refereeing, Geophysical Research Letters (2014)

PROFESSIONAL SERVICE

Committees

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

Review panels

- U.S. Department of Energy (DOE)
- U.S. National Aeronautics and Space Administration (NASA)
- U.S. National Science Foundation (NSF)
- U.S. National Oceanic and Atmospheric Administration (NOAA) Climate Program
- European Co-operation in the Field of Science and Technology (COST)
- Academy of Finland

PUBLICATIONS

ResearcherID: B-7652-2013
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1. *On Climate Change and Trade Cumulus Organization,* J. Kazil, Narenpitak, P., Yamaguchi,, T. and Feingold, G., Journal of Advances in Modeling Earth Systems, in review, 2023
2. *Segregation of Fast-Reactive Species in Atmospheric Turbulent Flow*, G. P. Brasseur, Barth, M., Kazil, J., Patton, E, G., and Wang, Y., Atmosphere, 14, 1136-1151, doi:10.3390/atmos14071136, 2023
3. *The Sugar-To-Flower Shallow Cumulus Transition Under the Influences of Diel Cycle and Free-Tropospheric Mineral Dust*, P. Narenpitak, Kazil, J., Yamaguchi, T., Quinn, P. K., and Feingold, G., J. Adv. Model. Earth Syst., doi:10.1029/2022MS003228, 2023
4. *Projecting stratocumulus transitions on the albedo-cloud fraction relationship reveals linearity of albedo to droplet concentrations*, T. Goren, Feingold, G., Gryspeerdt, E., Kazil, J., Kretzschmar, J., Jia, H. L., Quaas, J., Geophys. Res. Lett., doi:10.1029/2022GL101169, 2022
5. *Cloud adjustments from large-scale smoke-circulation interactions strongly modulate the southeastern Atlantic stratocumulus-to-cumulus transition*, M. S. Diamond, Saide, P. E., Zuidema, P., Ackerman, A. S., Doherty, SJ., Fridlind, A. M., Gordon, H., Howes, C., Kazil, J., Yamaguchi, T., Zhang, J-H., Feingold, G., Wood, R., Atmos. Chem. Phys., doi:10.5194/acp-22-12113-2022, 2022
6. *Segmentation-based multi-pixel cloud optical thickness retrieval using a convolutional neural network*, V. Nataraja, Schmidt, S., Chen, H., Yamaguchi, T., Kazil, J., Feingold, G., Wolf, K., Iwabuchi, H., Atm. Meas. Tech., doi:10.5194/amt-15-5181-2022, 2022
7. *Realism of Lagrangian large eddy simulations driven by reanalysis meteorology: tracking a pocket of open cells under a biomass burning aerosol layer*, J., Kazil, Christensen, M. W., Abel, S. J., Yamaguchi, T., Feingold, G., J. Adv. Model. Earth Syst., doi:10.1029/2021MS002664, 2021
8. *From sugar to flowers: a transition of shallow cumulus organization during ATOMIC*, P., Narenpitak, Kazil, J., Yamaguchi, T., Quinn, P., Feingold, G., J. Adv. Model. Earth Syst., doi:10.1029/2021MS002619, 2021
9. EUREC^{4}A, B. Stevens, Bony, S., Farrell, D., Ament, F., Blyth, A., Fairall, C., et al., Earth Sys. Sci. Data, doi:10.5194/essd-13-4067-2021, 2021
10. *Observations from the NOAA P-3 aircraft during ATOMIC*, R. Pincus, Fairall, C. W., Bailey, A., Chen, H. N., Chuang, P. Y., de Boer, G., Feingold, G., Henze, D., Kalen, Q. T., Kazil, J., Leandro, M., Lundry, A., Moran, K., Naeher, D. A., Noone, D., Patel, A. J., Pezoa, S., PopStefanija, I., Thompson, E. J., Warnecke, J., Zuidema, P., Earth Sys. Sci. Data, doi:10.5194/essd-13-3281-2021, 2021
11. *Large hemispheric difference in nucleation mode aerosol concentrations in the lowermost stratosphere at mid- and high latitudes*, C. J. Williamson, Kupc, A., Rollins, A., Kazil, J., Froyd, K. D., Ray, E. A., Murphy, D. M., Schill, G. P., Peischl, J., Thompson, C., Bourgeois, I., Thomas, B. R. A., Diskin, G. S., DiGangi, J. P., Blake, D. R., Bui, T. P. V., Dollner, M., Weinzierl, B., Brock, C. A., Atmos. Chem. Phys., doi:10.5194/acp-21-9065-2021, 2021
12. *The potential role of organics in new particle formation and initial growth in the remote tropical upper troposphere*, A. Kupc, Williamson, C. J., Hodshire, A. L., Kazil, J., Ray, E., Bui, T. P., Dollner, M., Froyd, K. D., McKain, K., Rollins, A., Schill, G. P., Thames, A., Weinzierl, B. B., Pierce, J. R., Brock, C. ., A., Atmos. Chem. Phys., doi:10.5194/acp-20-15037-2020, 2020
13. *Anthropogenic air pollution delays marine stratocumulus breakup to open cells*, T. Goren, Kazil, J., Hoffmann, F., Yamaguchi, T., Feingold, G., Geophys. Res. Lett., doi:10.1029/2019GL085412, 2019
14. *Aerosol-cloud interactions in trade wind cumulus clouds and the role of vertical wind shear*, T. Yamaguchi, Feingold, G., Kazil, J., J. Geophys. Res., doi:10.1029/2019JD031073, 2019
15. *Analysis of albedo versus cloud fraction relationships in liquid water clouds using heuristic models and large eddy simulation*, G. Feingold, Balsells, J., Glassmeier, F., Yamaguchi, T., Kazil, J., McComiskey, A., J. Geophys. Res., doi:10.1002/2017JD026467, 2017

16. *Stratocumulus to cumulus transition by drizzle*, T. Yamaguchi, G. Feingold, and J. Kazil, J. Adv. Model. Earth Syst., 9, doi:10.1002/2017MS001104, 2017
17. *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
18. *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
19. *Stratocumulus to cumulus transition capped by a light-absorbing smoke layer*, T. Yamaguchi, G. Feingold, J. Kazil, and A. McComiskey, Geophys. Res. Lett., 42, 10478–10485, doi:10.1002/2015GL066544, 2015
20. *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
21. *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
22. *On the interaction between marine boundary layer cellular cloudiness and surface heat fluxes*, J. Kazil, G. Feingold, H. Wang, T. Yamaguchi, Atmos. Chem. Phys., 14, 61-79, doi:10.5194/acp-14-61-2014, 2014
23. *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, and L. R. Leung, Geosci. Model Dev., 6, 861–874, doi:10.5194/gmd-6-861-2013, 2013
24. *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
25. *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, A. Laaksonen, Geosci. Model Dev., 5, 1323-1339, doi:10.5194/gmd-5-1323-2012, 2012
26. *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 : The global aerosol-climate model ECHAM-HAM, version 2: sensitivity to improvements in process representations, Atmos. Chem. Phys., 12, 8911-8949, doi:10.5194/acp-12-8911-2012, 2012
27. *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, 2011
28. *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, and E.-G. Brunke, Atmos. Chem. Phys., 11, 7817–7838, 2011
29. *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, 2011
30. *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, 2010
31. *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, 2010

32. *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, 2009
33. *Tropospheric new particle formation and the role of ions*, J. Kazil, R. G. Harrison, and E. R. Lovejoy, Space Sci. Rev., 137, 241–255, 2008
34. *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
35. *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, and A. Sogachev, I. Riipinen, F. Stratmann, and M. Kulmala, Boreal Env. Res., 12, 279–294, 2007
36. *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, 2007
37. *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, 2007
38. *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
39. *Tropospheric ionization and aerosol production: A model study*, J. Kazil and E. R. Lovejoy, J. Geophys. Res., 109, D19206, 2004
40. *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, 2003