

Columbia University
Department of Earth and Environmental Engineering
Mudd Hall, New York, NY 10027
Email: kl3231@columbia.edu
Website: https://kdlamb.github.io

FIELD OF SPECIALIZATION

Atmospheric Physics	Aerosol and Cloud Physics
AI for Climate	Physics-Informed Machine Learning
Scientific Machine Learning	Reduced Order Modeling

ACADEMIC TRAINING

Ph.D., University of Chicago, Physics Advisor: Elisabeth J. Moyer Thesis: In Situ Isotopic Water as a Tracer of Cold Cloud Microphysics	2015
M.S., University of Chicago, Physics Advisor: Cheng Chin Topic: Atomic, Molecular, and Optical Physics	2008
B.S., University of Illinois Urbana-Champaign, Physics Summa Cum Laude, with highest distinction in the curriculum	2007

ACADEMIC APPOINTMENTS

Associate Research Scientist Department of Earth and Environmental Engineering, Columbia University	2020 — current New York, NY
Adjunct Assistant Professor Climate School, Columbia University	2025 — current New York, NY
Research Scientist I/II Cooperative Institute for Research in the Environmental Sciences/NOAA Chemical Sciences Division	2016 — 2020 Boulder, CO

RESEARCH LEADERSHIP & PROGRAM APPOINTMENTS

Executive Committee Member, AI for Science, Learning the Earth with Artificial Intelligence and Physics Center.	2026 - present
Group Leader, Scientific Machine Learning, Learning the Earth with Artificial Intelligence and Physics Center.	2026 - present
Senior Researcher, Learning the Earth with Artificial Intelligence and Physics Center.	2021 - present
Research Team Lead, Aerosols Team, Frontier Development Laboratory Europe.	2022
Researcher, GNSS Forecasting Team, NASA Frontier Development Laboratory.	2019

SPONSORED RESEARCH GRANTS (PI OR CO-PI)

Department of Energy, Genesis Program (PI: Lamb, \$750,000)	Aug. 2026 - April 2027
Department of Energy, Atmospheric Systems Research Program (PI: Lamb, \$899,158)	Aug. 2022 - July 2027
Google Awards for Machine Learning and Education with TPUs (PI: Lamb, \$64,000+\$50,000 GCP credits)	June 2026 - June 2027
NSF Center for Learning the Earth with Artificial Intelligence and Physics, Internal RFPs, (PI: Lamb, \$440,000)	Jan. 2023 - Jan. 2027
Zegar Family Foundation Grant (Co-PI's: Lamb & Gentine, \$594,230)	Aug. 2023 - July 2026
Columbia Research Stabilization Funding (PI: Lamb, \$91,094)	July 2025 - July 2026

MAJOR COLLABORATIVE RESEARCH GRANTS

NSF STC, Center for Learning the Earth with Artificial Intelligence and Physics, (PI: Gentine, \$22,470,000)	Sept. 2026 - Oct. 2031
NASA Digital Twins for Climate Science: Challenges and Potential Paths Forward (PI: Schmidt, \$2,146,596)	Sept. 2023 - Aug. 2026
Department of Energy, Genesis Program (PI: Sedlacek, \$750,000)	Aug. 2026 - April 2027

AWARDS & HONORS

Blavatnik Regional Postdoctoral Award Nominee, Columbia University	2025
NASA Group Achievement Award, ATOM Campaign	2019
Finalist, Flame Challenge, "What is Climate?", Alan Alda Center for Science Communication	2018
NASA Group Achievement Award, KORUS-AQ Campaign	2017
NOAA Earth System Research Laboratory Gold Star Award for Scientific Outreach	2016
Winstein Travel Award, University of Chicago, Department of Physics	2014
NSF Graduate Research Fellowship	2009
National Defense Science and Engineering Graduate (NDSEG) Fellowship	2009
Robert G. Sachs Summer Fellowship, University of Chicago, Department of Physics	2007
Maria Goeppert-Mayer Fellowship, University of Chicago, Department of Physics	2007
Outstanding Senior Award, UIUC Campus Honors Program	2007
Laura B. Eisenstein Award, UIUC Department of Physics	2007
Commonwealth Edison/Beryl Bristow Award, UIUC Department of Physics	2005

COMPUTATIONAL ALLOCATIONS

NCAR/CISL Large Allocation (PI: **Lamb**, 6,000,000 core hours on NCAR's Derecho) Nov. 2024 - Sept. 2026
NCAR/CISL Data Analysis Allocation (PI: **Lamb**, 10,000 core hours; 2500 GPU hours on NCAR's Casper) July 2023 - July 2025

COLLABORATIONS

ERC Advanced Grant (PI: **Pontil**, as named collaborator) June 2026 - June 2031
NASA Quantitative Evaluation of Foundation Models (PI: **Carroll**, as named collaborator) October 2024 - 2025

ATMOSPHERIC FIELD CAMPAIGNS AND LABORATORY STUDIES

Science Team, NASA Atmospheric Tomography Mission (AToM). 2016 - 2018
Science Team, NOAA FIREX Firelab Study. 2016
Science Team, NASA/NIER Korean-United States Air Quality Study (KORUS-AQ). 2016 - 2017
Science Team, AQUAVIT-2 - atmospheric water vapor instrument intercomparison campaign. 2013
Science Team, IsoCLOUD - atmospheric isotopic water vapor measurement campaign. 2012 - 2013

PUBLICATIONS (H-INDEX: 17, CITATIONS: 1048), [†]DAGGER INDICATES AS SUPERVISING RESEARCH MENTOR, UNDERLINE INDICATES MENTEE

- [1] **K.D. Lamb**, J.Y. Harrington, A. Moyle, G. Pokrifka, B. Clouser, V. Ebert, O. Moehler, H. Saathoff. Discovering How Ice Crystals Grow using Neural Ordinary Differential Equations and Symbolic Regression. In press, *Science Advances*.
- [2] M.H. Erfani, **K.D. Lamb**[†], S.E. Bauer, K. Tsigaridis, M. van Lier Walqui, G. Schmidt. Spatio-Temporal Machine Learning Models for the Emulation of Aerosol Concentrations in Earth System Models. *Journal of Geophysical Research: Machine Learning and Computation*, 3, 3, e2025JH001011, 2026.
- [3] **K.D. Lamb**, C. Singer, K. Loftus, H. Morrison, M. Powell, J. Ko, J. Buch, A. Hu, M. van Lier Walqui, P. Gentine. Perspectives on Systematic Cloud Microphysics Scheme Development with Machine Learning. *Journal of Advances in Modeling Earth Systems*, 18, 1, 2026.
- [4] Aaryan Doshi, **K.D. Lamb**[†]. Unsupervised Classification of Absorbing Aerosols Detected by the Single Particle Soot Photometer. *Atmospheric Measurement Techniques*, 18, 7767-7786, 2025.
- [5] J.J. Donohue, **K.D. Lamb**[†]. Structured Dataset of Reported Cloud Seeding Activities in the United States (2000 - 2025) using a Large Language Model. *Nature Scientific Data*, 12, 1996, 2025.
- [6] J. Ko, J.Y. Harrington, K. Sulia, V. Przybylo, M. van Lier Walqui, **K.D. Lamb**[†]. A Machine Learning Framework for Predicting Microphysical Properties of Ice Crystals from Cloud Particle Imagery. *Journal of Geophysical Research: Machine Learning and Computation*, 2, 4, e2025JH000905, 2025.
- [7] J. Nathaniel, C. Roesch, J. Buch, D. DeSantis, A. Rupe, **K.D. Lamb**[†], P. Gentine. Deep Koopman operator framework for causal discovery in nonlinear dynamical systems. *Communications Physics*, 2025, 8, 513, 2025.
- [8] K. Liao, J. Buch, **K.D. Lamb**[†], P. Gentine. Simulating the Air Quality Impacts of Prescribed Fires Using a Graph Neural Network-Based PM2.5 Emissions Forecasting System. *Environmental Data Science*, 4:e11. doi:10.1017/eds.2025.4, 2025.
- [9] M. Liu, H. Matsui, D. Hamilton, S. Rathod, **K.D. Lamb**, N. Mahowald. Representation of iron aerosol size distribution is critical in evaluating atmospheric soluble iron input to the ocean. *Atmospheric Chemistry and Physics*, 24, 22, 13115-13127, 2024.
- [10] **K.D. Lamb**, M. van Lier Walqui, S. Santos, H. Morrison. Reduced order modeling for linearized representations of microphysical process rates. *Journal of Advances in Modeling Earth Systems*, 10.1029/2023MS003918, 2024.
- [11] **K.D. Lamb**, P. Gentine. Zero-Shot Learning of Aerosol Optical Properties Using Graph Neural Networks. *Scientific Reports*, 13, 18777, 2023.
- [12] S. Shamekh, **K.D. Lamb**, Y. Huang, P. Gentine. Implicit Learning of Convective Organization Explains Precipitation Stochasticity. *Proceedings of the National Academy of Sciences*, 120 (20) e2216158120, 2023.
- [13] J.M. Katich, E. Apel, I. Bourgeois, C. Brock, T.P. Bui, P. Campuzano-Jost, R. Commane, B. Daube, M. Dollner, M. Fromm, K.D. Froyd, A.J. Hills, R.S. Hornbrook, J. Jimenez, A. Kupc, **K.D. Lamb**, K. McKain, F. Moore, D.M. Murphy, B.A. Nault, J. Peischl, D.A. Peterson, E.A. Ray, K.H. Rosenlof, T. Ryerson, G.P. Schill, J.C. Schroder, B. Weinzierl, C. Thompson, C.J. Williamson, S. Wofsy, P. Yu, J.P. Schwarz. Pyrocumulonimbus significantly impact average stratospheric aerosol composition. *Science*, 379, 6634, 2023.
- [14] **K.D. Lamb**, J. Harrington, B.W. Clouser, E.J. Moyer, L. Sarkozy, V. Ebert, O. Möhler, and H. Saathoff. Re-evaluating cloud chamber constraints on depositional ice growth in cirrus clouds– Part 1: Model description and sensitivity tests. *Atmospheric Chemistry and Physics*, 23, 6043-6064, 2023.
- [15] A. E. Perring, B. Mediavilla, D. Wilbanks, J. Churnside, R. Marchbanks, **K.D. Lamb**, R-S. Gao. Airborne Bioaerosol Observations Imply a Strong Terrestrial Source in the Summertime Arctic. *Journal of Geophysical Research: Atmospheres*, doi: 10.1029/2023JD039165, 2023.
- [16] M. Liu, H. Matsui, D.S. Hamilton, **K.D. Lamb**, S.D. Rathod, J.P. Schwarz, N.M. Mahowald. The under-appreciated role of anthropogenic sources in atmospheric soluble iron flux to the Southern Ocean. *npj Climate and Atmospheric Science*, 5, 28, 2022.
- [17] C.C. Womack, K.M. Manfred, N.L. Wagner, G. Adler, A. Franchin, **K.D. Lamb**, A.M. Middlebrook, J.P. Schwarz, C.A. Brock, S.S. Brown, R.A. Washenfelder. Complex refractive indices in the ultraviolet and visible spectral region for highly absorbing non-spherical biomass burning aerosol. *Atmospheric Chemistry and Physics*, 21, 7235-7252, 2021.
- [18] Y. Choi, Y.S. Ghim, M. Segal-Rozenhaimer, J. Redemann, S.E. LeBlanc, Y. Lee, T. Lee, T. Park, J.P. Schwarz, **K.D. Lamb**, C.J. Flynn, R.J. Johnson, and A.E. Perring. Temporal and spatial variations of aerosol optical properties over the Korean peninsula during KORUS-AQ. *Atmospheric Environment*, 118301, ISSN 1352-2310, 2021.
- [19] **K.D. Lamb**, H. Matsui, J. Katich, A.P. Perring, J.R. Spackman, B. Weinzierl, M. Dollner, and J.P. Schwarz. Global-scale constraints on light-absorbing anthropogenic iron oxide aerosols. *npj Climate and Atmospheric Science* 4, 15, 2021.

- [20] C. Cho, J.P. Schwarz, A.E. Perring, **K.D. Lamb**, Y. Kondo, J.U. Park, D.H. Park, K. Shim, J.S. Park, R.J. Park, M. Lee, C.K. Song, S.W. Kim. Light-absorption enhancement of black carbon in the Asian outflow: Airborne SP2 observations during KORUS-AQ. *Science of the Total Environment*, Jun 15, 2021.
- [21] C.E. Jordan, J.H. Crawford, A.J. Beyersdorf, T.F. Eck, H.S. Halliday, B.A. Nault, L.-S. Chang, R. Park, G. Lee, H. Kim, S. Cho, H.J. Shin, J.H. Lee, J. Jung, D.S. Kim, M. Lee, T. Lee, A. Whitehall, J. Szykman, M.K. Schueneman, P. Campuzano-Jost, J.L. Jimenez, J.P. DiGangi, G.S. Diskin, B.E. Anderson, R.H. Moore, L.D. Ziemba, M.A. Fenn, J.W. Hair, R.E. Kuehn, R.E. Holz, G. Chen, K. Travis, M. Shook, D.A. Peterson, **K.D. Lamb**, J.P. Schwarz. Investigation of Factors Controlling PM_{2.5} Variability across the South Korean peninsula during KORUS-AQ. *Elementa: Science of the Anthropocene* 8, 2020.
- [22] L. Sarkozy, B. Clouser, **K.D. Lamb**, E.J. Stutz, H. Saathoff, O. Möhler, S. Wagner, V. Ebert, B. Kühnreich, and E. Moyer. The Lab Chicago Water Isotope Spectrometer: a tunable diode laser spectrometer for chamber-based measurements of water vapor isotopic evolution during cirrus formation. *Review of Scientific Instruments*, 91, 4, 2020.
- [23] P.E. Saide, M. Gao, Z. Lu, D. Goldberg, D.G. Streets, J.-H. Woo, A. Beyersdorf, C. Corr, K.L. Thornhill, B. Anderson, J.W. Hair, A.R. Nehr, G.S. Diskin, J.L. Jimenez, B.A. Nault, P. Campuzano-Jost, J. Dibb, E. Heim, **K.D. Lamb**, J.P. Schwarz, A.E. Perring, J. Kim, M. Choi, B. Holben, G. Pfister, A. Hodzic, G.R. Carmichael, L. Emmons, J.H. Crawford. Understanding and improving model representation of aerosol optical properties for a Chinese haze event measured during KORUS-AQ. *Atmospheric Chemistry and Physics*, 20, 11, 6455-6478, 2020.
- [24] B. Clouser, **K.D. Lamb**, L. Sarkozy, A. Nisenoff, J. Habig, V. Ebert, H. Saathoff, O. Möhler, and E. Moyer. No anomalous supersaturation in ultracold cirrus laboratory experiments. *Atmospheric Chemistry and Physics*, 20, 1089-1103, 2020.
- [25] **K.D. Lamb**. Classification of iron oxide aerosols with a single particle soot photometer using supervised machine learning. *Atmospheric Measurement Techniques*, 12, 3885-3906, 2019.
- [26] G. Adler, N. Wagner, **K.D. Lamb**, K. Manfred, J. Schwarz, A. Franchin, A. Middlebrook, R. Washenfelder, C. Womack, R. Yokelson, and D. Murphy. Evidence in biomass burning smoke for light-absorbing aerosol with properties intermediate between black and brown carbon. *Aerosol Science and Technology*, p. 976-989, 2019.
- [27] H. Li, **K.D. Lamb**, J. Schwarz, V. Selimovic, R. Yokelson, G. McMeeking, and A. May. Inter-comparison of black carbon measurement methods for simulated open biomass burning emissions. *Atmospheric Environment*, Vol. 206, p.156-169, 2019.
- [28] B. Nault, P. Campuzano-Jost, D. Day, J. Schroder, B. Anderson, A. Beyersdorf, D. Blake, W. Brune, Y. Choi, C. Corr, J. de Gouw, J. Dibb, J. DiGangi, G. Diskin, A. Fried, L.G. Huey, M. Kim, C. Knute, **K.D. Lamb**, T. Lee, T. Park, S. Pusede, E. Scheuer, K. Thornhill, J.-H. Woo, and J. Jimenez. Secondary organic aerosol production from local emissions dominates the organic aerosol budget over Seoul, South Korea, during KORUS-AQ. *Atmospheric Chemistry and Physics*, 18(24):17769-17800, 2018.
- [29] **K.D. Lamb**, A. Perring, B. Samset, D. Peterson, S. Davis, B. Anderson, A. Beyersdorf, D. Blake, P. Campuzano-Jost, C. Corr, G. Diskin, Y. Kondo, N. Moteki, B. Nault, J. Oh, M. Park, S. Pusede, I. Simpson, K. Thornhill, A. Wisthaler, and J. Schwarz. Estimating Source Region Influences on Black Carbon Abundance, Microphysics, and Radiative Effect Observed Over South Korea. *Journal of Geophysical Research: Atmospheres*, 123(23): 13527-13548, 2018.
- [30] K.M. Manfred, R.A. Washenfelder, N.L. Wagner, G. Adler, F. Erdesz, C.C. Womack, **K.D. Lamb**, J.P. Schwarz, A. Franchin, and V. Selimovic. Investigating biomass burning aerosol morphology using a laser imaging nephelometer. *Atmospheric Chemistry and Physics*, 18(3):1879-1894, 2018.
- [31] **K.D. Lamb**, B.W. Clouser, M. Bolot, L. Sarkozy, V. Ebert, H. Saathoff, O. Möhler, and E.J. Moyer. Laboratory measurements of HDO/H₂O isotopic fractionation during ice deposition in simulated cirrus clouds. *Proceedings of the National Academy of Sciences*, 114(22):5612-5617, 2017.
- [32] **K.D. Lamb**, C.C. Gerry, Q. Su, and R. Grobe. Unitary and nonunitary approaches in quantum field theory. *Physical Review A*, 75(1):013425, 2007.
- [33] **K.D. Lamb**, S. Menon, Q. Su, and R. Grobe. Non-perturbative retrieval of the scattering strength in one-dimensional media. *Physical Review E*, 74(6):061903, 2006.

UNDER REVIEW

- [1] G. Nicolaou, K. Frields, T. Stephens, Y. Cai, K. Sulia, J. Ko, **K.D. Lamb**[†]. Inferring Thermodynamic Histories from In Situ Ice Crystal Imagery via Conditional Diffusion Models. Under review, *Journal of Geophysical Research: Machine Learning and Computation*.
- [2] M.H. Erfani, **K.D. Lamb**[†], S.E. Bauer, K. Tsigaridis, M. van Lier Walqui, G. Schmidt. Interactive Atmospheric Composition Emulation for NASA GISS Earth System Model. Submitted, *Journal of Advances in Modeling Earth Systems*.

MANUSCRIPTS IN PREPARATION

- [1] **K.D. Lamb**[†], J. Donohue. Assessing the Climatological Significance of Cloud Seeding in the Western United States. In preparation for *Nature Climate Change*.
- [2] P. Gentile, D. Balwada, A. Pacal, L. Hawkins, A. Adcroft, J. Fang, A. Lahlou, **K.D. Lamb**, D.M. Lawrence, J. LeSommer, J. Mouallem, D. Watson-Parris, V. Eyring. IegoESM: a modular, differentiable, multi-scale AI-ready Earth system model built with AI Agents. In preparation for *Nature*.
- [3] J. Ko, H. Govindarajan, F. Lindsten, V. Przybylo, K. Sulia, M. van Lier Walqui, **K.D. Lamb**[†]. A multi-campaign aircraft dataset of in situ cloud particle imagery and co-located thermodynamic measurements. In preparation for *Nature Scientific Data*.
- [4] T. Stephens, G. Nicolaou, K. Frields, K. Chandrakar, J. Ko, **K.D. Lamb**[†]. Inferring Instantaneous Depositional Ice Growth Rates from Ice Crystal Images. In preparation for *Journal of Geophysical Research: Machine Learning and Computation*.
- [5] O. Sturm, **K.D. Lamb**[†], J. Ko, A. Ngyuen, P. Dicus, E. Ware, S. Silva, K.K. Chandrakar. A Golden Spiral of Thermodynamic Histories: Characterizing Trajectories of Ice Crystals in Cirrus Clouds as Modeled by Particle-based Microphysics in CM1. In preparation for *Atmospheric Chemistry and Physics*.
- [6] J. Buch, **K.D. Lamb**[†], C.E. Singer, P. Gentile. Optimizing cloud seeding for rain enhancement with a denoising diffusion model. In preparation for *Atmospheric Chemistry and Physics*.

MACHINE LEARNING WORKSHOP PAPERS (PEER-REVIEWED)

- [1] J. Ko, H. Govindarajan, F. Lindsten, V. Pryzblo, K. Sulia, **K.D. Lamb**[†]. Understanding Ice Crystal Habit Diversity with Self-Supervised Learning. *Tackling Climate Change with AI Workshop*. 2025 Conference on Neural Information Processing Systems.
- [2] **M. Erfani, K.D. Lamb**[†], S.E. Bauer, K. Tsigaridis, M. van Lier-Walqui, G. Schmidt. Interactive Atmospheric Composition Emulation for Next-Generation Earth System Models. *Tackling Climate Change with AI Workshop*. 2025 Conference on Neural Information Processing Systems.
- [3] **K.D. Lamb** and J.Y. Harrington. Discovering How Ice Crystals Grow Using Neural Ordinary Differential Equations and Symbolic Regression. *Machine Learning for the Physical Sciences Workshop*. 2024 Conference on Neural Information Processing Systems.
- [4] **M. Erfani, K.D. Lamb**[†], S.E. Bauer, K. Tsigaridis, M. van Lier-Walqui, G. Schmidt. Spatio-Temporal Machine Learning Models for Emulation of Global Atmospheric Composition. *Tackling Climate Change with AI Workshop*. 2024 Conference on Neural Information Processing Systems.
- [5] **K. Liao, J. Buch, K.D. Lamb**[†], P. Gentine. Simulating the Air Quality Impacts of Prescribed Fires Using a Graph Neural Network-Based PM2.5 Forecasting System. (Spotlight Talk), In *Tackling Climate Change with AI Workshop*. 2023 Conference on Neural Information Processing Systems.
- [6] J. Will, A. Jenney, **K.D. Lamb**, M.S. Pritchard, C. Kaul, P-L Ma, K. Pressel, J. Shpund, M van Lier Walqui, S. Mandt. Understanding and Visualizing Droplet Distributions in Simulations of Shallow Clouds with Variational Autoencoders. In *Machine Learning and the Physical Sciences Workshop* 2023 Conference on Neural Information Processing Systems.
- [7] **E. Diaz Salas-Porras, K. Tazi, A. Braude, D. Okoh, K.D. Lamb**[†], D. Watson-Parris, P. Harder, N. Meinert. "Identifying the origins of Pyrocumulonimbus (PyroCb) events using an Invariance Causal Prediction framework." In *Workshop on Causality for Real-world Impact*. 2022 Conference on Neural Information Processing Systems.
- [8] **K. Tazi, E. Diaz Salas-Porras, A. Braude, D. Okoh, K.D. Lamb**[†], D. Watson-Parris, P. Harder, N. Meinert. "Pyrocast: a Machine Learning Pipeline to Forecast Pyrocumulonimbus (PyroCb) clouds." In *Tackling Climate Change with AI Workshop*. 2022 Conference on Neural Information Processing Systems.
- [9] **K.D. Lamb**. "A deep learning approach for classifying black carbon aerosol morphology." In *Tackling Climate Change with AI Workshop* 2019 Conference on Neural Information Processing Systems, Vancouver, BC, Dec. 2019.
- [10] **K.D. Lamb**^{*}, G. Malhotra^{*}, A. Vlontzos^{*}, E. Wagstaff^{*}, A.G. Baydin, A. Bhiwandiwalla, Y. Gal, A. Kalaitzis, A. Reina and A. Bhatt (*equal contributions). "Prediction of GNSS Phase Scintillations: A Machine Learning Approach." In *Machine Learning and the Physical Sciences Workshop* 2019 Conference on Neural Information Processing Systems, Vancouver, BC, Dec. 2019.
- [11] **K.D. Lamb**^{*}, G. Malhotra^{*}, A. Vlontzos^{*}, E. Wagstaff^{*}, A.G. Baydin, A. Bhiwandiwalla, Y. Gal, A. Kalaitzis, A. Reina and A. Bhatt (*equal contributions) "Correlation of Auroral Dynamics and GNSS Scintillation with an Auto-encoder." In *Machine Learning and the Physical Sciences Workshop* 2019 Conference on Neural Information Processing Systems, Vancouver, BC, Dec. 2019.

TEACHING EXPERIENCE

Instructor	AI & ML for Climate, Summer 2025, 2026 (CLMT 5043, ~ 20 students)	Columbia University
Instructor/Organizer	AMS AI Short Course, Winter 2024, 2025 (~ 50 students/year)	American Meteorological Society
Guest Lecturer	Graduate level atmospheric science courses, 2023 - 2026	Columbia University
Teaching Assistant	Global Warming (PHSC 13400), Spring 2015	University of Chicago
Teaching Assistant	Electricity & Magnetism (PHYS 132), Winter 2014	University of Chicago
Teaching Assistant	Waves, Heat, & Optics (PHYS 133), Spring 2013	University of Chicago
Organizer	Physics Pedagogy Graduate Seminar, 2013 - 2014	University of Chicago
Teaching Assistant	Mechanics & Heat (PHYS 101), Spring 2006	University of Illinois Urbana-Champaign

STUDENTS AND POSTDOCS SUPERVISED

Postdocs (3):

Joseph Ko, Postdoctoral researcher (Columbia University), 2023 - present

Mohammad Erfani, Postdoctoral researcher (Columbia University/NASA GISS, co-advised with Susanne Bauer, now at Scripps), 2024 - 2026

Jatan Buch, Postdoctoral researcher (Columbia University, co-advised with Pierre Gentine, now at Aeolus), 2023 - 2025

Ph.D. Committees (2):

Paul Borne Pons, Institut Polytechnique de Paris

Zachary Nice, Pennsylvania State University

Ph.D. Students (4):

Georgia Nicolaou, LEAP Momentum Fellow (UCSD), 2025

Obin Sturm, LEAP Momentum Fellow (USC), 2024

Jonas M. Mikhael, Graduate researcher (Columbia University), 2023 - 2024

Matthew Beveridge, LEAP Momentum Fellow, (Columbia University), 2023

Aerosols Team - Kenza Tazi, Emiliano Diaz, Ashwin Braude, Daniel Okoh (Frontier Development Lab Europe), 2022

M.S. Students (1):

Jared Donohue, DSI Scholar (Columbia University), 2025

Undergraduate Students (6):

Troy Stephens, LEAP REU student (Georgia Tech, now at Boston College), 2025

Katherine Fields, LEAP REU student (UC Irvine), 2025

Patrick Dicus, LEAP REU student (Hamilton College), 2024

Ashley Nguyen, LEAP REU student (UC Berkeley), 2024

Ryan Anselm, Undergraduate REU student (Columbia University), 2022

Melanie Thatcher, Intern (NOAA/STAR Fellows Program), 2017

High School Students (2):

Kyleen Liao, High school student (Saratoga High School, 2024 Regeneron top 300 Scholar, now at Stanford), 2022 - 2024

Aaryan Doshi, High school student (Monta Vista High School, 2025 Regeneron top 300 Scholar, now at Stanford), 2023 - present

SERVICE & OUTREACH

Session Chair	NeurIPS 2026 Program Committee, Workshop on Representation Learning in the Physical Sciences, 2026 Program Domain Co-Chair for Climate, Weather & Earth Sciences, PASC2026 Conference, Zurich, Switzerland, 2026 Co-Chair, AI for Earth Science; AI for Satellite Observations, AMS Annual Meeting, New Orleans, LA, 2025 Co-Chair, AI for Statistical Parameterization of Unresolved Processes in ESM, AMS Annual Meeting, Baltimore, MD, 2024 Program Committee, Climate, Weather & Earth Sciences, PASC2025 Conference, Zurich, Switzerland, 2025 Program Committee, Climate, Weather & Earth Sciences, PASC2024 Conference, Zurich, Switzerland, 2024 Convener, Data-driven parameterization development, DOE ARM/ASR PI meeting, Rockville, MD, 2025 Convener, Data-driven parameterization development, DOE ARM/ASR PI meeting, Rockville, MD, 2023 Co-Convener, Cirrus in the Upper Troposphere/Lower Stratosphere, AGU Fall Meeting, Chicago, IL 2022 Co-Chair, AMS Conference on Atmospheric Radiation, Vancouver, BC, 2018
Committees	Columbia University Senate, Professional Research Officer (by election), 2025 - 2027 AMS Artificial Intelligence Applications to Environmental Science STAC Committee, 2023-2029 US CLIVAR Process Study and Model Improvement (PSMI) Panel, 2025-2029
Organizer	Monthly Atmospheric Composition/Chemistry Meetup, Columbia/LDEO, 2023-present Bi-weekly Climate-Machine Learning Journal Club, LEAP/Columbia, 2021-2023 Organizer, Cirrus Cloud Workshop, University of Chicago/LMD Paris, 2014
Editorial	Editor, <i>Atmospheric Chemistry and Physics</i> , 2025 - present Associate Editor (invited), <i>Journal of Atmospheric Science</i> , 2023 - 2024
Grant/Fellowship Reviewer	L'Agence Nationale de la Recherche (ANR), 2025 Climate Change AI Innovation Grants Reviewer, 2021; Meta-reviewer, 2024 National Science Foundation Reviewer, 2018 - 2023 US Department of Energy Grant Reviewer, 2020 National Defense Science and Engineering Graduate Fellowship Evaluation Panel, Geosciences, 2017-2020 NASA Citizen Science Earth Systems Atmospheric Sciences Panel, Washington DC, 2016
Peer Review (ML conf.)	ICLR Climate Change AI Workshop, NeurIPS AI4Earth Workshop, ICLR AI for Earth and Space Science Workshop
Peer Review (Journals)	<i>Journal of Geophysical Research: Atmospheres</i> , <i>Environmental Science and Technology</i> , <i>Atmospheric Pollution Research</i> , <i>Atmospheric Environment</i> , <i>Atmospheric Chemistry and Physics</i> , <i>Journal of Advances in Modeling Earth Systems</i> , <i>Physical Review Letters</i> , <i>Environmental Data Science</i> , <i>Artificial Intelligence for the Earth Systems</i> , <i>Aerosol Science and Technology</i> , <i>Journal of Atmospheric Science</i> , <i>Geophysical Research Letters</i> , <i>Science Advances</i>
Judge	Senior Physics Division Assistant Captain, Colorado State Science and Engineering Fair, Fort Collins, CO, 2017 AGU Conference Outstanding Student Poster Awards, 2016-2017
Speaker	American Museum of Natural History/LEAP/NVIDIA Urban Futures Hack-a-thon, 2026 PeoriaCorps Career Series, 2022 Presenter, NASA Frontier Development Lab 2019 Showcase, Google Cloud HQ, Mountainview CA, 2019 Colorado Science Day, Colorado State Capitol, Denver, CO, 2018 National Honors Society Induction, Osan Air Force Base High School, Pyongtaek, S. Korea, 2016
Mentor	Mentor, NeurIPS Tackling Climate Change with AI Workshop, 2021 Mentor, ICML Tackling Climate Change with AI Workshop, 2020 Earth Explorers Program (STEM program for 7th and 8th graders), Boulder, CO, 2017 STEM mentor, Girls Do Hack, Adler Planetarium, Chicago, IL, 2015 STEM mentor, Next Gen 2013 Conference, Museum of Science and Industry, Chicago, IL 2013-2014
Science Advisor	Instrument to Instrument Translation/NASA Multi-domain Reusable AI Tools (Trillium), 2023-2024 UAE Rain Enhancement Program 7th Cycle, 2026

SEMINARS, WORKSHOPS, & INVITED PRESENTATIONS

- [1] "Automating Earth System Model Parameterization Development with Agentic AI". Invited Presentation, AI for Science, ICES Biennial Workshop VIII Geneva, Switzerland, September 2026.
- [2] "Accelerating Cloud Microphysics Scheme Development with Machine Learning". Invited Presentation (Plenary), 17th AMS Conference on Cloud Physics. Madison, WI, August 2026.
- [3] "Physics-Informed Machine Learning of Ice Microphysical Processes". Invited Presentation (Plenary), DOE ARM/ASR PI meeting. Virtual, July 2026.
- [4] "Automating Parameterization Development for Earth System Models with Agentic AI". Lectures in Climate Data Science. Learning the Earth with Artificial Intelligence and Physics Center, Columbia University, July 2026.
- [5] "Learning Ice Cloud Processes Across Scales Using Physics-Informed Machine Learning". Invited Presentation, Department of Physics, Imperial College London. London, UK, May 2026.
- [6] Invited Presentation, UN "AI for Good" Seminar, Climate Series. Virtual, March 2026.
- [7] Invited Presentation, Department of Atmospheric Science, Colorado State University. Fort Collins, CO, February 2026.
- [8] "Learning Cloud Processes from In Situ Observations Using Physics-Informed Machine Learning". Invited Presentation, Fall Seminar Series. Department of Earth and Environmental Engineering, Columbia University, November 2025.

- [9] “Learning Ice Cloud Processes Across Scales Using Physics-Informed Machine Learning”. Invited Presentation, Gordon Research Conference on Radiation and Climate. Lewiston, Maine, July, 2025.
- [10] “Learning Cloud Processes Across Scales Using Scientific Machine Learning”. Invited Presentation, Meteorology Colloquium. Karlsruhe Institute of Technology, Karlsruhe, Germany, April 2025.
- [11] “Learning Cloud Processes Across Scales Using Scientific Machine Learning”. Invited Presentation, Fall Seminar Series. Brookhaven National Laboratory, Upton, NY, November 2024.
- [12] “Physics-Informed Machine Learning for Ice Microphysical Processes”. International Commission on Clouds and Precipitation, Journal Club, Remote, October 2024.
- [13] “Learning Cloud Processes Across Scales Using Scientific Machine Learning”. Invited Presentation, ELIITT Focus Period Symposium “Machine Learning and Climate Science” University of Linköping, Sweden, October 2024.
- [14] “Learning Cloud Processes Across Scales Using Scientific Machine Learning.” Invited Talk, INCUS Science Team Meeting. Virtual, September 2024.
- [15] “Towards Improved Representation of Cloud Microphysical Processes Using Machine Learning.” Invited Talk, US CLIVAR PCMI Panel Meeting. NOAA GFDL, Princeton, NJ, September 2024.
- [16] “Learning Cloud Processes Across Scales Using Scientific Machine Learning”. Invited Presentation, Columbia Climate School Faculty Seminar Series, Columbia University, New York, September 2024.
- [17] “Learning Cloud Processes Across Scales Using Scientific Machine Learning”. Invited Presentation, Scientific Understanding through Data Science Seminar Series, NASA JPL, Virtual, July 2024.
- [18] “Towards Improved Cloud Parameterizations in Climate Models Using Machine Learning.” Invited Talk, Machine Learning for Earth System Modeling Workshop, ICML Conference 2024. Vienna, Austria, July 2024.
- [19] “Towards Improved Representation of Cloud Microphysical Processes Using Machine Learning.” Invited Talk, iMIRACLI Workshop on aerosol-cloud interactions and machine learning. University of Oxford, Oxford, UK, June 2024.
- [20] “Towards Improved Cloud Microphysical Scheme Development Using Machine Learnings.” Invited Talk, M2LiNES Annual Meeting. Armonk, NY, June 2024.
- [21] “Using In Situ Observations to Understand Ice Growth in Cirrus Clouds”. Invited Presentation, Workshop on Ice Clouds, University of Vienna, Vienna, Austria, April 2024.
- [22] “Zero-shot Learning of Aerosol Optical Properties with Graph Neural Networks”. Seminar, Korean Institute for Advanced Study, Virtual, March 2024.
- [23] “Learning Cloud Processes Across Scales Using Machine Learning”. Seminar, Mechanical and Aerospace Engineering Department, Princeton University, Princeton, NJ, March 2024.
- [24] “Using Cloud Chamber Observations to Understand Ice Growth in Cirrus Clouds”. Colloquium, Dept. of Meteorology, Pennsylvania State University, State College, PA, January 2024.
- [25] “Learning Cloud Processes Across Scales Using Data-Driven Reduced Order Modeling”. Seminar, NASA GISS, New York, NY, October 2023.
- [26] “Using Cloud Chamber Observations to Understand Ice Growth in Cirrus Clouds”. Seminar, Clima Group Microphysics Group, California Institute of Technology, Pasadena, CA, September 2023.
- [27] “Learning Cloud Processes Across Scales Using Data-Driven Reduced Order Modeling”. Seminar, Clima Group, California Institute of Technology, Pasadena, CA, September 2023.
- [28] “Learning Cloud Processes Across Scales Using Data-Driven Reduced Order Modeling”. Seminar, Atmospheric Science Department, University of Illinois Urbana Champaign, Champaign, IL, September 2023.
- [29] “Re-evaluating observational constraints on depositional ice growth in cirrus clouds”. Earth Science Colloquium, Lamont-Doherty Earth Observatory. Palisades, NY, April 2023.
- [30] “Improving process level understanding of aerosols and clouds using observations and high resolution modeling”. Seminar, Department of Geophysics, Cambridge University. Cambridge, UK, September 2022.
- [31] “Improving process level understanding of aerosol and cloud microphysics using observations and high resolution modeling”. Seminar, Department of Atmospheric Sciences, University of Miami. Miami, FL, April 2022.
- [32] “Improving process level understanding of aerosol and cloud microphysics using observations and high resolution modeling”. Seminar, Department of Earth and Planetary Sciences, University of California, Berkeley. Berkeley, CA, April 2022.
- [33] “Improving process level understanding of aerosol and cloud microphysics using observations and high resolution modeling”. Seminar, Department of Earth, Atmospheric, and Planetary Sciences, Purdue University. West Lafayette, IN, March 2022.
- [34] “HD-SP2 measurements of black carbon containing aerosols on the NASA DC-8 during KORUS-AQ”. Seminar, Earth and Planetary Systems Science Group, University of Tokyo. Tokyo, Japan, Feb. 2017.
- [35] “In situ isotopic water vapor measurements as a tracer of cold cloud microphysics.” Seminar, Aerosol Group, NOAA ESRL Chemical Sciences Division. Boulder, CO, Nov. 2015.
- [36] “First Direct measurements of isotopic fractionation of water vapor over ice at temperatures below 235 K.” Seminar, Commissariat à l’Énergie Atomique. Gif-sur-Yvette, France, April 2015.
- [37] “Modeling Cloud Simulation Experiments for the First Direct Measurements of Isotopic Fractionation of Water Vapor over Ice at Temperatures below 235 K.” Invited Presentation, Workshop on Mathematical Modeling, Northeastern Illinois University. Chicago, IL, May 2015.
- [38] “Improving understanding of ice nucleation and growth inhibition via new isotopic tracer studies in the AIDA aerosol and cloud chamber.” Seminar for Metrology Group, Physikalisch-Technische Bundesanstalt. Braunschweig, Germany, April 2012.

CONFERENCE ORAL PRESENTATIONS

- [1] **K.D. Lamb**, C. Singer, K. Loftus, H. Morrison, M. Powell, J. Ko, J. Buch, A. Hu, M. van Lier Walqui, P. Gentine. Invited Presentation, “Systematic Cloud Microphysics Scheme Development with Machine Learning” AMS Annual Meeting, 2026. Houston, TX, 2026.
- [2] **K.D. Lamb**, J. Ko, G. Nicolaou, K. Fields, T. Stephens. Invited Presentation, “Inferring microphysical process rates from in situ observations using physics-informed machine learning” AMS Annual Meeting, 2026. Houston, TX, 2026.
- [3] **K.D. Lamb**, J. Donohue. “Using Synthetic Control to Assess the Climatological Significance of Cloud Seeding in the Western United States with a Structured Data Set of Reported Activities from 2000 - 2025” AMS Annual Meeting, 2026. Houston, TX, 2026.
- [4] **K.D. Lamb**, J. Buch, J. Ko, M. Powell, J. Nathaniel, P. Gentine. “A differentiable framework to reduce structural and parametric uncertainty in cloud microphysics parameterizations online” AMS Annual Meeting, 2025. New Orleans, LA, 2025.
- [5] **K.D. Lamb**, J. Buch, J. Ko, M. Powell, J. Nathaniel, P. Gentine. Invited Presentation, “A differentiable framework to reduce structural and parametric uncertainty in cloud microphysics parameterizations online” AGU Fall Meeting 2024. Washington, DC, December 2024.
- [6] **K.D. Lamb**, S. Shamekh, Y. Huang, P. Gentine. “Exploring convective regimes in tropical moist convection using machine learning” Joint GEWEX-AOS-INCUS Convection Tracking Workshop, NASA GISS, New York, NY, April 2024.
- [7] **K.D. Lamb**, P. Gentine. Invited Talk, “Zero-Shot Learning of Aerosol Optical Properties with Graph Neural Networks.” EGU General Assembly 2024. Vienna, Austria, April 2024.
- [8] **K.D. Lamb**, J. Mikhaeil, J.Y. Harrington. “Learning Constraints on Depositional Ice Growth Models from Cloud Chamber Experiments with Neural Ordinary Differential Equations.” AMS Annual Meeting. Baltimore, MD, January 2024.
- [9] **K.D. Lamb**, P. Gentine. “Exploring Phase Transitions and Dynamical Processes in Tropical Moist Convection using Machine Learning.” AMS Annual Meeting. Baltimore, MD, January 2024.
- [10] **K.D. Lamb**, P. Gentine. Invited Talk, “Exploring Phase Transitions and Dynamical Processes in Tropical Moist Convection using Machine Learning.” AGU Fall Meeting 2023. San Francisco, CA, December 2023.
- [11] **K.D. Lamb**, M. van Lier Walqui, S. Santos, H. Morrison. “Reduced Order Modeling to Reduce Structural Uncertainty in Representing Cloud Microphysical Process Rates.” AGU Fall Meeting 2023. San Francisco, CA, December 2023.
- [12] **K.D. Lamb**, M. van Lier Walqui, S. Santos, H. Morrison. Invited Talk, “Reducing Structural Uncertainty in Cloud Microphysical Models.” SIAM Mini-Symposium: Understanding cloud physics using stochastic, dynamical, and data-driven modeling. Amsterdam, Netherlands, March 2023.
- [13] **K.D. Lamb**, M. van Lier Walqui, S. Santos, H. Morrison. “Unsupervised Learning of Cloud Microphysical Process Rates.” In 2023 Joint Atmospheric Radiation Measurement (ARM) User Facility/Atmospheric System Research (ASR) Principal Investigators Meeting. Rockville, MD, August 2023.
- [14] **K.D. Lamb**, P. Gentine. “Zero-Shot Learning of Aerosol Optical Properties with Graph Neural Networks.” In NOAA AI Workshop 2021. Virtual, Sept. 2021.
- [15] **K.D. Lamb**, G. Malhotra, A. Vlontzos, E. Wagstaff, A.G. Baydin, A. Bhiwandiwalla, Y. Gal, A. Kalaitzis, A. Reina and A. Bhatt. “Correlation of Auroral Dynamics and GNSS Scintillation with an Autoencoder.” In *2nd AI and Data Science Workshop for Earth and Space Sciences*. NASA JPL (Virtual), Feb. 2021.
- [16] **K.D. Lamb**. “Classification of iron oxide aerosols with a single particle soot photometer using supervised machine learning.” In FASCINATE Conference on the Frontiers of Atmospheric Science and Chemistry. Boulder, CO, Sept. 2019.
- [17] **K.D. Lamb**, Perring, Katich, J., Thatcher, M., Froyd, K., A.E., Spackman, R., Weinzierl, B., and Schwarz, J.P. “Constraints on Anthropogenic Iron Oxide Aerosols on a Global Scale.” In 15th AMS Conference on Atmospheric Radiation. Vancouver, BC, July 2018.
- [18] **K.D. Lamb**, Perring, A.E., Ahn, J. and Schwarz, J.P. “HD-SP2 Measurements of Black Carbon Containing Aerosols in South Korea during KORUS-AQ.” In AGU Fall Meeting Abstracts. San Francisco, CA, Dec. 2016.
- [19] **K.D. Lamb**, Clouser, B., Sarkozy, L., Stutz, E., Wagner, E., Ebert, V., Kerstel, E., Saathoff, H., Möhler, O., and Moyer, E. “Implications of the IsoCloud campaigns at the AIDA Cloud Chamber for Ice Growth in Cold Cirrus.” In 14th AMS Conference on Cloud Physics. Boston, MA, July, 2015.

CONFERENCE POSTER PRESENTATIONS

- [1] **K.D. Lamb**, J. Donohue. “Using Synthetic Control to Assess the Climatological Significance of Cloud Seeding in the Western United States with a Structured Data Set of Reported Activities from 2000 - 2025” In EGU General Assembly 2026. Vienna, Austria, May 2026.
- [2] **K.D. Lamb**, J.Y. Harrington. “Discovering How Ice Crystals Grow Using Neural Ordinary Differential Equations and Symbolic Regression” AGU Fall Meeting 2024 Washington, DC, 2024.
- [3] **K.D. Lamb**, J. Buch, J. Ko, M. Powell, J. Nathaniel, P. Gentine. “A differentiable framework to reduce structural and parametric uncertainty in cloud microphysics parameterizations online” Micro2Macro US Clivar Workshop. Laramie, WY, October 2024.
- [4] **K.D. Lamb**, J. Mikhaeil, J. Harrington, M. van Lier Walqui. “Cloud chamber constraints on depositional ice growth models.” AGU Fall Meeting 2023. San Francisco, CA, December 2023.
- [5] **K.D. Lamb**, J. Ko, J. M. Mikhaeil, J. Harrington, M. van Lier Walqui. “Data-driven approaches to constraining depositional ice growth models in cirrus clouds.” In 2023 Joint Atmospheric Radiation Measurement (ARM) User Facility/Atmospheric System Research (ASR) Principal Investigators Meeting. Aug. 2023.
- [6] **K.D. Lamb**, M. van Lier Walqui, S. Santos, H. Morrison. “Unsupervised learning of microphysical process rates using generative machine learning models.” In AGU Fall Meeting. Dec. 2022.
- [7] **K.D. Lamb**, J. Harrington, M. van Lier Walqui. “Re-evaluating cloud chamber constraints on depositional ice growth in cirrus clouds.” In 2022 Joint Atmospheric Radiation Measurement (ARM) User Facility/Atmospheric System Research (ASR) Principal Investigators Meeting. Oct. 2022.

- [8] **K.D. Lamb**, P. Gentine “Zero Shot Learning of Aerosol Optical Properties with Graph Neural Networks. ” In AGU Fall Meeting. 13-17 Dec., 2021.
- [9] **K.D. Lamb**, P. Gentine “Predicting the Optical Properties of Arbitrarily Shaped Black Carbon Aerosols with Graph Neural Networks. ” In EGU General Assembly 2021. Virtual, 19-30 Apr., 2021.
- [10] **K.D. Lamb**, Perring, A.E., Nault, B., Campuzano-Jost, P., Jimenez, J.-L., Weinheimer, A., Blake, D., Anderson, B., and Schwarz, J.P. “Strong black carbon absorption enhancement attributed to secondary organic aerosol formation in Seoul.” In Cooperative Institute for Research in the Environmental Sciences Rendezvous 2019. Boulder, CO, May 2019.
- [11] **K.D. Lamb**, Harrington, J.Y., Clouser, B., Ebert, V., Möhler, O., Saathoff, H. and Moyer, E.J. “Do Surface Kinetics Play a Role in Depositional Ice Growth in Cirrus Clouds?” In AGU Fall Meeting Abstracts. Washington, D.C., Dec. 2018.
- [12] **K.D. Lamb**, Perring, A.E., Beyersdorf, A., Anderson, B., Flynn, C., Segal-Rosenhaimer, M., Redemann, J., Samset, B., Holben, B., and Schwarz, J.P. “Black Carbon’s Contribution to Aerosol Absorption Optical Depth in South Korea.” In NOAA ESRL Global Monitoring Annual Conference. Boulder, CO, May 2018.
- [13] **K.D. Lamb**, Perring, A.E., Beyersdorf, A.J., Anderson, B.E., Segal-Rosenhaimer, M., Redemann, J., Holben, B.N. and Schwarz, J.P. “Black Carbon’s Contribution to Aerosol Absorption Optical Depth in South Korea.” In AGU Fall Meeting Abstracts. New Orleans, LA, Dec. 2017.
- [14] **K.D. Lamb**, McMeeking, G., Li, H., May, A., and Schwarz, J.P. “Volatility of materials internally mixed with black carbon from biomass burning.” In NOAA ESRL Global Monitoring Annual Conference. Boulder, CO, May 2017.
- [15] **K.D. Lamb**, Perring, A.E., and Schwarz, J.P. “Measurements of black carbon containing aerosols in South Korea during KORUS-AQ.” In International Global Atmospheric Chemistry Project 2016 Science Conference. Breckenridge, CO, Sept. 2016.
- [16] **K.D. Lamb**, Clouser, B., Sarkozy, L., Wagner, S., Ebert, V., Kerstel, E., Saathoff, H., Möhler, O. and Moyer, E. “Implications of the ISOCLOUD campaigns at the AIDA Cloud Chamber for ice growth in cold cirrus.” In EGU General Assembly Conference Abstracts (Vol. 17). Vienna, Austria, April 2015.
- [17] **K.D. Lamb**, Clouser, B., Sarkozy, L., Stutz, E., Kühnreich, B., Landsberg, J., Habig, J., Hiranuma, N., Wagner, S., Ebert, V., Kerstel, E., Möhler, O., Saathoff, H., and Moyer, E. “Investigations into Anomalous Supersaturation in Cold Cirrus at the AIDA Cloud Chamber during the ISOCLOUD Campaigns.” In AGU Fall Meeting Abstracts. San Francisco, CA, Dec. 2013.
- [18] **K.D. Lamb**, Clouser, B., Sarkozy, L., Stutz, E., Kühnreich, B., Landsberg, J., Habig, J., Hiranuma, N., Wagner, S., Ebert, V. and Kerstel, E., Möhler, O., Saathoff, H., and Moyer, E. “Direct Measurements of Isotopic Fractionation Factors of Water Vapor over Ice for Temperatures Below 235 K.” In Goldschmidt Conference 2013. Florence, Italy, Aug. 2013.
- [19] **K.D. Lamb**, Aho, S., Bolot, M., Wienhold, F., Peter, T., Legras, B. and Moyer, E.J. “Isotopic signatures as a tracer of cold cloud microphysical processes.” In AGU Fall Meeting Abstracts. San Francisco, CA, Dec. 2012.
- [20] **K.D. Lamb**, Sharma, A., Scherpelz, P., Brickman Soderberg, K.A., Gemelke, N. and Chin, C. “Progress Towards Scalable Quantum Manipulation using Two Atomic Species in Independent Optical Lattices.” In APS Prairie Section Meeting Abstracts. Nov. 2009.
- [21] **K.D. Lamb**, Sharma, A., Scherpelz, P., Brickman Soderberg, K.A., Gemelke, N. and Chin, C. “Experimental Progress Towards Scalable Quantum Computing using Dual Atomic Species in Independent Optical Lattices.” In Midwest Cold Atom Workshop. Nov. 2008.

SCIENCE TEAM MEETING PRESENTATIONS

- [1] **K.D. Lamb**, J. Ko, O. Sturm, A. Nguyen, P. Dicus, G. Nicolaou, K. Fields, T. Stephens. “Inferring microphysical process rates from in situ observations using physics-informed machine learning”. NSF LEAP STC Annual Meeting. New York, NY, Oct. 2025.
- [2] **K.D. Lamb**, J. Ko, J.Y. Harrington, M.van Lier Walqui. “Discovering How Ice Crystals Grow using Neural Ordinary Differential Equations and Symbolic Regression”. NSF LEAP STC Annual Meeting. New York, NY, Oct. 2024.
- [3] **K.D. Lamb**, J. Ko, T. Eidhammer, H. Morrison, J.Y. Harrington, M.van Lier Walqui. “Machine Learning Enhanced Unified Ice Microphysics Scheme Development”. CESM Atmospheric Working Group Meeting. Boulder, CO, Feb. 2024.
- [4] **K.D. Lamb**, J. Ko, J. Mikhaeil, J.Y. Harrington, M.van Lier Walqui. “Reducing Structural Uncertainty in Ice Growth Models using Neural Ordinary Differential Equations”. NSF LEAP STC Annual Meeting. New York, NY, Oct. 2023.
- [5] **K.D. Lamb**, M.van Lier Walqui, J.Y. Harrington, H. Morrison, A. Gettelman. “Unification of Observations via Learning Algorithms for Robust Models of Ice Microphysics”. NSF LEAP STC Annual Meeting. New York, NY, Jan. 2023.
- [6] **K.D. Lamb** “A Graph Neural Network Approach for Modeling Aerosol Optical Properties”. USMILE Collaboration Meeting. Virtual, Oct. 2020.
- [7] **K.D. Lamb**, Matsui, H., Fahey, D., Katich, J., Perring, A., Spackman, R., Thatcher, M., Weinzierl, B., and Schwarz, J.P. “Global-scale constraints on light-absorbing anthropogenic combustion iron oxide aerosols”. ATOM Science Team Meeting. Boulder, CO, Nov. 2019.
- [8] **K.D. Lamb**, Katich, J., Matsui, H., Perring, A., Spackman, R., Thatcher, M., Weinzierl, B., and Schwarz, J.P. “Expanding the role of the SP2: in situ measurements of atmospheric iron oxide concentrations”. ATOM Science Team Meeting. Boulder, CO, Nov. 2018.
- [9] **K.D. Lamb**, Perring, A.E., Nault, B., Campuzano-Jost, P., Jimenez, J.-L., Weinheimer, A., Blake, D., Anderson, B.E., Beyersdorf, A., Corr, C.A., Thornhill, K., and Schwarz, J.P. “Internally mixed black carbon as a tracer of SOA production in the Seoul Metropolitan Area.” NASA KORUS-AQ Science Team Meeting. Irvine, CA, Aug. 2018.
- [10] **K.D. Lamb**, Adler, G., Cappa, C., Franchin, A., Li, H., Manfred, K., May, A., McMeeking, G., Middlebrook, A., Selimovic, V., Wagner, N., Washenfelder, R., Womack, C., Yokelson, B., and Schwarz, J.P. “Constraints on black carbon optics from biomass burning.” NOAA Firelab Science Team Meeting. Boulder, CO, Nov. 2017.
- [11] **K.D. Lamb**, Perring, A.E., Oh, J., Ahn, J.-Y., Diskin, G., Wisthaler, A., Wennberg, P., Yang, M., and Schwarz, J.P. “HD-SP2 measurements of black carbon containing aerosols on the NASA DC-8 during KORUS-AQ.” KORUS-AQ Science Team Meeting. Seongwipo, S. Korea, March 2017.

- [12] **K.D. Lamb**, Bolot, M., Clouser, B., Sarkozy, L., Wagner, S., Ebert, V., Kerstel, E., Saathoff, H., Möhler, O., and Moyer, E. “Isotopic Fractionation in small ice crystals growing from vapor in the AIDA cloud chamber.” UChicago/ Laboratoire Meteorologique Dynamique Cirrus Cloud Workshop. Chicago, IL, Sept. 2014.
- [13] **K.D. Lamb**, Clouser, B., Sarkozy, L., Stutz, E., Wagner, E., Ebert, V., Kerstel, E., Saathoff, H., Möhler, O., and Moyer, E. “Cloud Chamber Studies of Isotopic Fractionation and Ice Growth in Cold Cirrus Clouds.” IsoCloud Science Team Meeting. Karlsruhe, Germany, January 2013.

PANEL DISCUSSIONS

- [1] Panelist, “The Rise of Agentic AI: What It Means for Climate Innovation.” New York City Climate Week New York, NY September 2026
- [2] Panelist, “Downscaling Climate Data: An Academia-Private Sector Collaboration.” Tamer Institute for Social Enterprise and Climate Change, Columbia Business School, New York, NY May 2026
- [3] Panelist, “Columbia Climate School New York Climate Week Panel.” The Forum, Columbia University, New York, NY September 2024
- [4] Panelist, “Cross-Sector Collaboration for AI in Weather/Climate.” AMS Washington Forum, Silver Creek, MD, May 2024
- [5] Panelist, “Climate Data Science: Multi-Disciplinary Perspectives on Research Convergence.” Learning the Earth with Artificial Intelligence and Physics (LEAP) NSF Science and Technology Center, Columbia University, New York, NY, March 2024

SOCIETY MEMBERSHIPS

American Geophysical Union
American Meteorological Society
European Geophysical Union

MEDIA & PRESS

Scientists Mull Controversial Plan to Steer Hurricanes. [Link], USA Today, June 30, 2026.

Company claims cloud-seeding breakthrough could help the parched West. [Link], The Washington Post, April 27, 2026.

Need To Know: Geoengineering and Cloud Seeding. [Link], State of the Planet, July, 2025.

We’re finally solving the puzzle of how clouds will affect our climate. [Link], New Scientist, September, 2024.

Ice-Cloud Puzzle Master. [Link], DOE Atmospheric System Research Profile Piece, March, 2024.

How AI could power the climate breakthroughs the world needs. [Link], CNN, November, 2023.

Towering Wildfire Clouds Are Affecting the Stratosphere, and the Climate. [Link], State of the Planet, February, 2023.

Can Climate Models Aid Adaptation Efforts with Help from A.I.? [Link] Sustain What? Webcast, December 2022.

How Studying the Clouds Can Improve Climate Models. [Link], State of the Planet, November, 2022.

DOE Awards \$14 Million to Improve Climate Change Predictions. [Link] DOE ARM News, November, 2022.

Human-made iron inputs to the Southern Ocean ten times higher than previously estimated. [Link] EurekaAlert! AAAS, May, 2022.

New spectrometer measures water vapor isotopic evolution in cirrus clouds [Link] AIP SciLight, 2020.

NASA flies low over South Korea to measure polluted air. [Link] CNN, June 2016.

On board NASA’s flying lab over South Korea. [Link] CNN, June 2016.