

Dylan C. Gaeta

Curriculum Vitae

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325 Broadway
Boulder, Colorado 80305

EDUCATION

Ph.D., Geography & Environmental Engineering 2020 – 2025
Johns Hopkins University Baltimore, MD

- *Dissertation*: “Emissions of trace gas air pollutants inferred from a long-term atmospheric measurement network: from fumigants to fossil fuels” (Advisor: Prof. Scot M. Miller)

M.S., Geophysical Sciences 2016 – 2018
The University of Chicago Chicago, IL

- *M.S. Thesis*: “An Adjoint Trajectory Model of the Perturbed Carbon Cycle”

B.S., Applied Mathematics 2012 – 2016
B.A., Chemistry 2012 – 2016
University of Rochester Rochester, NY

- *Honors*: Graduated *cum laude* with Highest Distinction in Chemistry, with Distinction in Mathematics, McNair Scholar, Chemistry Department Award, Undergraduate Teaching Award, Junior Scholar Award, Dean’s List 8 of 8 semesters, Chemistry Workshop Leader, NCAA Division III Track & Field Athlete

RESEARCH EXPERIENCE

Post-Doctoral Research Associate 2026 – Present
Cooperative Institute for Research in Environmental Sciences (CIRES),
University of Colorado Boulder
NOAA Global Monitoring Laboratory Boulder, CO

Doctoral Research, Greenhouse Gas Lab 2020 – 2025
Johns Hopkins University, Department of Environmental Health & Engineering Baltimore, MD

- <https://greenhousegaslab.org/>
- *Project*: Modeling and mapping of U.S. sulfur dioxide emissions based on atmospheric measurements from the NOAA Global Greenhouse Gas Reference Network (GGGRN) (with Prof. Scot M. Miller, Dr. Jens Mühle, and NOAA Global Monitoring Laboratory).
<https://www.nature.com/articles/s43247-024-01294-x>
- *Project*: Trends and patterns in terrestrial U.S. methyl bromide emissions post-Montreal Protocol inferred from long-term NOAA GGGRN measurements (with Prof. Scot M. Miller, Dr. Jens Mühle, and NOAA Global Monitoring Laboratory). (Manuscript in preparation)
- *Project*: Analysis of C₃-C₅ alkane emissions (propane, butane, pentane) from U.S. fossil fuel activities and associated impacts on surface-level ozone and air quality (with Prof. Scot M. Miller and NOAA Global Monitoring Laboratory). (Manuscript in preparation)
- *Project*: 2018–2020 Greenhouse Gas Emissions Inventory for Baltimore City (with the Baltimore Office of Sustainability and Prof. Scot M. Miller). Led analysis and report writing for Baltimore’s official Greenhouse Gas Emissions Inventory for reporting years 2018–2020, including an assessment of COVID-19 related impacts on emissions and progress toward Baltimore’s net-zero emissions target.
https://baltimoresustainability.org/wp-content/uploads/2023/04/2020_Baltimore_GHG_inventory_v2.pdf

- *Project*: 2017 Greenhouse Gas Emissions Inventory Report for Baltimore City (with the Baltimore Office of Sustainability and Prof. Scot M. Miller). Led the compilation, analysis, and report writing for Baltimore’s official Greenhouse Gas Emissions Inventory for reporting year 2017 and baseline year 2007. https://baltimoresustainability.org/wp-content/uploads/2021/09/2017_Baltimore_Inventory_v5-1.pdf

Applied Data and Governance Fellow

2019 – 2020

International Innovation Corps, The University of Chicago

Chicago, IL

- <https://www.iic.uchicago.edu/>
- *Project*: India Health Insurance Experiment (IHIE), research support team (with Prof. Anup Malani). Built code in Stata, R, Python, and L^AT_EX to process and analyze large health datasets from the IHIE, a large-scale randomized control trial that examines the health and financial impacts of expanding health insurance access to low-income populations in Karnataka, India.
- *Project*: Self Employed Women’s Association (SEWA) Wage Insurance Experiment (WIE), economic model building (with Prof. Alex Torgovitsky and Prof. Anup Malani). Developed Python code and algorithms for a discrete choice economic model used to calculate optimal wage insurance premiums for maximizing insurance coverage based on randomized control trial pilot data.
- *Project*: Historical reconstruction of migration patterns in India from historical census tables (with Prof. Anup Malani). Digitized and archived historical population data from Census of India print reports from 1860 to 2011.

Graduate Research Assistant

2016 – 2018

University of Chicago, Department of the Geophysical Sciences

Chicago, IL

- *M.S. thesis*: “An adjoint trajectory model of the perturbed carbon cycle” (with Prof. Douglas MacAyeal). Co-developed computational algorithms and model code for an inverse model of CO₂ emissions uptake by the atmosphere and oceans based on ocean carbonate chemistry and pH. <https://doi.org/10.6082/uchicago.3551>
- *Project*: Laboratory and field work in support of the 2017 StratoClim aircraft campaign in Kathmandu, Nepal (with Prof. Elisabeth Moyer & Dr. Benjamin Clouser). Worked with the Chicago Water Isotope Spectrometer (Chi-WIS) team to acquire high-altitude measurements of water vapor isotopes above the Asian Monsoon during 8 intensive research flights. <https://doi.org/10.5194/amt-2024-98>

International Student Research Experience (NSF iREU)

2015

Technische Universität Graz, Institut für Chemische Technologie von Materialien

Graz, Austria

- *Project*: Worked to develop synthesis techniques for metal-organic frameworks for lithium-ion battery materials (with Prof. Martin Wilkening).

McNair Scholars Research Program / NSF REU

2014 – 2015

University of Rochester, Department of Chemistry

Rochester, NY

- *Project*: Worked to develop synthesis techniques for water-soluble PbSe semiconductor nanocrystals (quantum dots) to expand the solar efficiency of an artificial photosynthesis system for H₂ production (with Prof. Todd Krauss).

PUBLICATIONS

Peer Reviewed Journals:

- “A decline in terrestrial methyl bromide emissions from the U.S. since the Montreal Protocol.” **D.C. Gaeta**, J. Mühle, S. Montzka, I.J. Vimont, M. Crotwell, L. Hu, A. Katten, M. Zhang, D. Waugh, S.M. Miller. *In Preparation* (2026).

- “Satellite-based emissions estimate indicates progress toward China’s methane mitigation goals” Z. Huang, A. Chen, L. Feng, W.S. Daniels, **D.C. Gaeta**, K.L. Morgan, L.T. Murray, X. Yu, B.F. Hobbs, S.M. Miller *In Review, PNAS* (2026).
- “No detectable inflection point in U.S. oil and gas methane emissions following the Inflation Reduction Act.” A. Chen, W.S. Daniels, Z. Huang, A.P. Ravikumar, S.M. Jordaan, Z. Zhang, L. Feng, H. Liu, L.T. Murray, X. Yu, **D.C. Gaeta**, K.L. Morgan, J. Yuan, S.M. Miller *In Review, Communications Earth & Environment*
- “Methane fluxes from arctic & boreal North America: Comparisons between process-based estimates and atmospheric observations.” H. Liu, F.R. Vogel, Z. Zhang, D.E.J. Worthy, L. Feng, A.L. Gagne-Landmann, A. Chen, Z. Huang, **D.C. Gaeta**, J.R. Melton, V. Yadav, D. Huntzinger, S.M. Miller (2026). <https://doi.org/10.5194/acp-26-1229-2026>
- “Spatial and temporal distribution of global wetland methane emissions during 2019–2020 estimated from satellite observations.” A. Chen, Z. Zhang, L. Feng, H. Liu, L. Murray, X. Yu, Z. Huang, **D.C. Gaeta**, K. Morgan, S.M. Miller (2025). <https://doi.org/10.1029/2025JD044354>
- “The Airborne Chicago Water Isotope Spectrometer: An Integrated Cavity Output Spectrometer for Measurements of the HDO/H₂O Isotopic Ratio in the Asian Summer Monsoon.” B.W. Clouser, L.C. Sarkozy, C.E. Singer, C.C. KleinStern, A. Desmoulin, **D.C. Gaeta**, S. Khaykin, S. Gabbard, S. Shertz, E.J. Moyer. *Atmospheric Measurement Techniques* (2025). <https://doi.org/10.5194/amt-18-6465-2025>
- “California dominates U.S. emissions of the pesticide and potent greenhouse gas sulfuryl fluoride.” **D.C. Gaeta**, J. Mühle, I.J. Vimont, M. Crotwell, L. Hu, J.B. Miller, K. McKain, B.C. Baier, M. Zhang, J. Bao, B.R. Miller, S.M. Miller. *Communications Earth & Environment* (2024). <https://doi.org/10.1038/s43247-024-01294-x>
- “U.S. ethane emissions and trends estimated from atmospheric observations.” M. Zhang, I.J. Vimont, S.M. Jordaan, L. Hu, K. McKain, M. Crotwell, **D.C. Gaeta**, S.M. Miller. *Environmental Science & Technology* (2024). <https://doi.org/10.1021/acs.est.4c00380>
- “The Orbiting Carbon Observatory-2 (OCO-2) and in situ CO₂ data suggest a larger seasonal amplitude of the terrestrial carbon cycle compared to many dynamic global vegetation models.” R. Lei, J. Poe, D. Huntzinger, J. Liu, S. Sitch, D. Baker, L. Feng, **D.C. Gaeta**, Z. Huang, S.M. Miller. *Remote Sensing of Environment* (2024). <https://doi.org/10.1016/j.rse.2024.114326>
- “Inter-annual Variability in Atmospheric Transport Complicates Estimation of US Methane Emissions Trends.” L. Feng, S. Tavakkoli, S. Jordaan, A.E. Andrews, J. Benmergui, D.W. Waugh, M. Zhang, **D.C. Gaeta**, S.M. Miller. *Geophysical Research Letters* (2023). <https://doi.org/10.1029/2022GL100366>

Other Works:

- “Greenhouse Gas Emissions Inventory for the City of Baltimore, 2018–2020” (2022). **D.C. Gaeta**, J. Alumbro, K. Negandhi, C. Liang, D. Moon, S.M. Miller. *Prepared for the Baltimore Office of Sustainability*. https://www.baltimoresustainability.org/wp-content/uploads/2023/04/2020_Baltimore_GHG_inventory_v2.pdf
- “City of Baltimore 2017 Greenhouse Gas Emissions Inventory Report” (2020). **D.C. Gaeta**, K. Negandhi, C. Liang, M. Kleckner, S.M. Miller. *Prepared for the Baltimore Office of Sustainability*. https://www.baltimoresustainability.org/wp-content/uploads/2021/09/2017_Baltimore_Inventory_v5-1.pdf
- “An Adjoint Trajectory Model of the Perturbed Carbon Cycle” (2018). **D.C. Gaeta**. *Knowledge@UChicago* (M.S. Thesis). <https://doi.org/10.6082/uchicago.3551>

CONFERENCE PRESENTATIONS

CIRES Rendezvous

- “A decline in U.S. methyl bromide emissions throughout 2007-2021.” **D.C. Gaeta**, J. Mühle, L. Hu, I.J. Vimont, M. Croswell, S. Montzka, S.M. Miller. *Environmental Monitoring and Observations* (Poster). Boulder, CO (2026)

American Geophysical Union Fall Meeting

- “Emissions of C₃-C₅ alkanes from the U.S. fossil fuel industry and implications for air quality.” **D.C. Gaeta**, M. Zhang, L. Feng, I.J. Vimont, M. Croswell, L. Hu, K. McKain, B.C. Baier, J.B. Miller, A. Andrews, S.M. Miller. *Emissions and Air Quality Impacts of Atmospheric Pollutants from Oil, Gas, and Coal Operations* (Oral Session A42E-06). Washington, D.C. (2024).
- “U.S. emissions of methyl bromide have declined since the Montreal Protocol phase-out, but not to zero.” **D.C. Gaeta**, J. Mühle, L. Hu, I.J. Vimont, S. Montzka, M. Croswell, M. Zhang, K. McKain, B.C. Baier, J.B. Miller, S.M. Miller. *General Atmospheric Chemistry, Urban Winter Air Quality, and Constraints on Atmospheric Oxidation Capacity* (Poster Session A21H-1855). Washington, D.C. (2024).
- “Trends in California’s methyl bromide emissions from 2004–2022 estimated using atmospheric measurements and inverse modeling.” **D.C. Gaeta**, J. Mühle, L. Hu, I.J. Vimont, S. Montzka, M. Croswell, K. McKain, B.C. Baier, J.B. Miller, M. Zhang, L. Feng, A. Chen, H. Liu, S.M. Miller. *Scientific Impact of Long-Term Observations of the Atmosphere* (Oral Session A24I-08). San Francisco, CA (2023).
- “Constraining U.S. Sulfuryl Fluoride Emissions with Atmospheric Measurements and a Geostatistical Inverse Model.” **D.C. Gaeta**, J. Mühle, I.J. Vimont, M. Croswell, K. McKain, B.C. Baier, J.B. Miller, M. Zhang, J. Bao, B.R. Miller, S.M. Miller. *Stratospheric and Tropospheric Composition Changes: Observations and Modeling of Special Events, Feedback Mechanisms, and Long-Term Trends* (Poster Session A52Q-1204). Chicago, IL (2022).
- “Greater Los Angeles Area dominates U.S. emissions of sulfuryl fluoride, a potent greenhouse gas.” **D.C. Gaeta**, J. Mühle, I.J. Vimont, M. Zhang, K. McKain, M. Croswell, B.R. Miller, S.M. Miller. *Constraining Greenhouse Gas Exchange Processes Using Remote Sensing and in Situ Observations* (Poster Session A15K-1789). New Orleans, LA (2021).
- “California dominates U.S. emissions of sulfuryl fluoride, a potent greenhouse gas.” **D.C. Gaeta**, I.J. Vimont, B.R. Miller, S.M. Miller. *Constraining Greenhouse Gas Exchange Processes Using Remote Sensing and in Situ Observations* (Lightning Talk/iPoster A128-11). Virtual (2020).
- “An Adjoint Trajectory Model of the Perturbed Carbon Cycle.” **D.C. Gaeta**, D.R. MacAyeal. *Coupled Human–Natural Systems and Global Environmental Change: Innovative Interdisciplinary Approaches* (Poster Session GC31D-1291). Washington, D.C. (2018).

TEACHING EXPERIENCE

Teaching Assistant / Field Trip Co-leader

Johns Hopkins University, Department of Environmental Health & Engineering

2021 – 2025

Baltimore, MD

- Case Studies in Climate Change: California (Seminar) (EN.570.320) (Prof. S. Miller)
- Case Studies in Climate Change (Field Course) (EN.570.321) (Prof. S. Miller)

- Co-led an annual 8-day field course for 10 undergraduate students in Death Valley National Park and the Eastern Sierras that focuses on past, present, and future climate change in California.

SOUL Instructor (Special Opportunities for Undergraduate Learning)

Johns Hopkins University

Fall 2023

Baltimore, MD

- SOUL: Greenhouse Gases in Earth's Atmosphere (AS.360.111)
 - Wrote a proposal and was successfully funded to teach a new 1.0-credit seminar course for 10 students that explored the mechanistic (process-based) relationship between GHGs and Earth's climate.

Teaching Assistant

University of Chicago, Physical Sciences Division and The College

2016 – 2018

Chicago, IL

- Global Warming: Understanding the Forecast (GEOS 23400) (Prof. D. Archer)
- Energy: Science, Technology, and Human Usage (GEOS 24750) (Prof. E. Moyer)
- Natural Hazards (PHSC 13600) (Prof. N. Nakamura)
- Earth as a Planet: Exploring Our Place in the Universe (PHSC 10800) (Prof. F. Ciesla)

Workshop Leader / Teaching Assistant

University of Rochester, Department of Chemistry

2013 – 2016

Rochester, NY

- Molecular Spectroscopy (CHM 232) (Laboratory manual revisions) (Prof. L. Rothberg)
- Physical Chemistry II: Molecular Thermodynamics (CHM 252) (Prof. J. Farrar)
- Physical Chemistry I: Quantum Chemistry (CHM 251) (Prof. L. Rothberg)
- Organic Chemistry I & II (CHM 203 & 204) (Prof. J. Goodman and Prof. B. Nilsson)
- Chemical Concepts, Systems, and Practice I & II (CHM 131 & 132) (Prof. J. Farrar and Dr. B. Hafensteiner)

LEADERSHIP AND OUTREACH

EHESO Sustainability Leadership Council Representative

Environmental Health & Engineering Student Organization, Johns Hopkins University

2023 – Present

Baltimore, MD

- <https://sustainability.jhu.edu/who-we-are/slc/>
- Elected to serve as the Department representative on the university-wide Sustainability Leadership Council. Served as a grant reviewer for the Campus as a Living Lab grant funding program: <https://sustainability.jhu.edu/research/livinglab/>

EHESO Graduate Representative Organization (GRO) Representative

Environmental Health & Engineering Student Organization, Johns Hopkins University

2023 – 2024

Baltimore, MD

- <https://studentaffairs.jhu.edu/gro>
- Elected to serve as the Environmental Health & Engineering Department Representative for the Graduate Representative Organization for Student Affairs on the Homewood campus.

Undergraduate Research Mentor

Greenhouse Gas Lab, Johns Hopkins University

2021 – Present

Baltimore, MD

- <https://greenhousegaslab.org/>

- Mentored and collaborated with Krittika Negandhi, Cheryl Liang, Mitchell Kleckner, Julia Alumbro, Daniel Moon, and Millie Mi on undergraduate research projects focused on urban emissions in Baltimore and other U.S. cities.

WISE High School Student Research Mentor 2022 – 2023
 Johns Hopkins University, Center for Educational Outreach, Western High School Baltimore, MD

- <https://engineering.jhu.edu/outreach/ceo-programs/wise/>
- Mentored and advised two Baltimore City high school students, Oumou Sall and Saria Malik, throughout paid internships at JHU. Designed and supervised projects to develop technical skills while focusing on greenhouse gas emissions from cities.

Johns Hopkins Science Policy Group Member 2020 – Present
 Johns Hopkins University, Homewood Campus Baltimore, MD

Young Alumni Council (Chicago Network) 2018 – 2023
 University of Rochester Chicago, IL

Co-organizer, Climate and Energy Student Lunch & Learn weekly series 2017 – 2018
 University of Chicago – EPIC/RDCEP Chicago, IL

HONORS AND AWARDS

Outstanding Doctoral TA Award 2024
 Johns Hopkins University, Department of Environmental Health & Engineering

Geyh-Bouwer Trainee Practice Award 2023
 Johns Hopkins University, Department of Environmental Health & Engineering

- <https://publichealth.jhu.edu/departments/environmental-health-and-engineering/research-and-practice/geyh-bouwer-trainee-practice-award/>
- The Geyh-Bouwer Trainee Practice Award recognizes students whose application of science demonstrates the betterment of the environment and/or public health.

EHE Department Retreat Poster Award 2023
 Johns Hopkins University, Department of Environmental Health & Engineering

GRO Conference Travel Grant 2020
 Johns Hopkins University

Carl A. Whiteman Jr. Teaching Award 2016
 University of Rochester

Ronald E. McNair Scholar 2013 – 2016
 United States Department of Education

Chemistry Department Award 2016
 University of Rochester

Junior Scholar Award 2015
 University of Rochester, Department of Chemistry

Dean's Scholarship University of Rochester	2012 – 2016
New York State Scholarship for Academic Excellence NYS Higher Education Services Corporation	2012 – 2016
Chautauqua Region Community Foundation Scholarship Chautauqua Region Community Foundation, Western New York	2012 – 2016