

Gabrielle R. Leung

Contact Information

Gabrielle Leung
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Research Interests

convective dynamics, mesoscale meteorology, microphysics, cloud feedbacks on climate, land-aerosol-cloud interactions, atmospheric modeling, satellite meteorology, object-based analysis

Education

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| 2025 | Ph.D. Atmospheric Science
Colorado State University (CSU), Fort Collins, CO, USA
<i>Dissertation Title:</i> “Aerosol and Land Surface Impacts on Tropical Convective Processes” |
| 2022 | M.S. Atmospheric Science
Colorado State University (CSU), Fort Collins, CO, USA
<i>Thesis Title:</i> “Processes Driving Shallow Convective Development and their Interactions with Aerosols: Aerosol Transport and Aerosol Breezes” |
| 2019 | B.S. Physics, <i>magna cum laude</i>
Ateneo de Manila University (ADMU), Quezon City, Philippines
<i>Thesis Title:</i> “Atmospheric Tracer Composition over the West Philippine Sea: Volatile Organic Compound Sources, Transport, and Impacts” |

Research and Work Experience

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| 2025 – Present | Anna Julia Cooper Postdoctoral Fellow
<i>University of Wisconsin</i> , Madison, WI, USA |
| 2020 – 2025 | Graduate Research Assistant
<i>van den Heever Research Group</i>
Colorado State University, Fort Collins, CO, USA |
| 2015 – 2020 | Research Assistant
<i>Air Quality Dynamics & Instrumentation Laboratory</i>
Manila Observatory, Quezon City, Philippines |
| 2018 – 2019 | Research Assistant
<i>Regional Climate Systems Laboratory</i>
Manila Observatory, Quezon City, Philippines |
| Summer 2018 | Student Intern
<i>Climatology Laboratory</i>
Tokyo Metropolitan University, Tokyo, Japan |

Grant and Fellowship Funding

NOAA Climate & Global Change Postdoctoral Fellowship <i>Selected, program not funded in 2025</i>	2025
NASA FINESST <i>Future Investigators in NASA Earth and Space Science and Technology Fellowship</i>	2022
CSU Walter Scott Jr. College of Engineering Graduate Fellowship	2020

Publications

13. Falk, N.M., **G.R. Leung**, L.D. Grant, and S.C. van den Heever, 2025: Cold Pools Reduce the Impacts of Deforestation on Convective Initiation. In review at *Geophys. Res. Lett.*
12. Dagan, G., [and co-authors, including **G.R. Leung**], 2025: Aerosol–Cloud Interactions in a Multimodel Ensemble of Radiative–Convective Equilibrium Simulations. In review at *J. Adv. Model. Earth Syst.*
11. Falk, N.M., [and co-authors, including **G.R. Leung**], 2024: Do Cold Pools Propagate According to Theory? In press at *J. Atmos. Sci.*
10. **Leung, G.R.**, L.D. Grant, and S.C. van den Heever, 2024: Deforestation-driven increases in shallow clouds are greatest in drier, low-aerosol regions in Southeast Asia. *Geophys. Res. Lett.* doi: 10.1029/2023GL107678
9. Sokolowsky, G.A.*, S.W. Freeman*, [and co-authors, including **G.R. Leung**], 2024. *tobac* v1.5: Introducing Fast 3D Tracking, Splits and Mergers, and Other Enhancements for Identifying Meteorological Phenomena. *these authors contributed equally to this work. *Geosci. Model Dev.* doi: 10.5194/gmd-17-5309-2024
8. **Leung, G.R.**, S.M. Saleeby, G.A. Sokolowsky, S.W. Freeman, and S.C. van den Heever, 2023: Aerosol-cloud impacts on aerosol detrainment and rainout in shallow maritime tropical clouds. *Atmos. Chem. Phys.* doi: 10.5194/acp-23-5263-2023
7. **Leung, G.R.**, and S.C. van den Heever, 2023: Aerosol breezes drive cloud and precipitation increases. *Nat. Comm.* doi: 10.1038/s41467-023-37722-3
6. Reid, J.S., [and co-authors, including **G.R. Leung**], 2023. The coupling between tropical meteorology, aerosol lifecycle, convection, and radiation, during the Clouds, Aerosol and Monsoon Processes Philippines Experiment (CAMP²Ex). *Bull. Am. Meteor. Soc.* doi: 10.1175/BAMS-D-21-0285.1
5. Collado, J.T., [and co-authors, including **G.R. Leung**], 2023. Spatiotemporal assessment of PM_{2.5} exposure of a high-risk occupational group in a Southeast Asian megacity. *Aerosol Air Qual. Res.* doi: 10.4209/aaqr.220134
4. **Leung, G.R.**, S.C. van den Heever, 2022. Controls on the development and circulation of terminal and transient congestus clouds and implications for midlevel aerosol transport. *J. Atmos. Sci.* doi: 10.1175/JAS-D-21-0314.1
3. Crosbie, E., [and co-authors, including **G.R. Leung**], 2022. Measurement report: Closure analysis of aerosol-cloud composition in tropical maritime warm convection. *Atmos. Chem. Phys.* doi: 10.5194/acp-22-13269-2022
2. Stahl, C., [and co-authors, including **G.R. Leung**], 2021. Total organic carbon and the contribution from speciated organics in cloud water: airborne data analysis from the CAMP²Ex field campaign. *Atmos. Chem. Phys.* doi: 10.5194/acp-21-14109-2021
1. Lorenzo, G.R., [and co-authors, including **G.R. Leung**], 2021. Measurement report: Firework impacts on air quality in Metro Manila, Philippines, during the 2019 New Year revelry. *Atmos. Chem. Phys.* doi: 10.5194/acp-21-6155-2021

Publications in Progress

- **Leung, G.R.** and S.C. van den Heever: Deforestation impacts on clouds and precipitation over Borneo vary across the diurnal cycle. In preparation.
- **Leung, G.R.**, J.B. Bukowski, I.T. Singh, L.D. Grant, P.J. Marinescu, S.C. van den Heever: Representation of updraft velocity and precipitation rate distributions as a function of grid spacing. In preparation.

Honors and Awards

AMS Outstanding Student Presentation Award <i>2nd Symposium of Cloud Physics</i>	2025
JPL Center for Climate Sciences Summer School participant	2023
Herbert Riehl Memorial Award <i>CSU Department of Atmospheric Science, for best publication based on thesis work</i>	2023
David L. Dietrich Honorary Scholarship <i>CSU Department of Atmospheric Science, for outstanding aerosol & air quality research</i>	2022
AMS Outstanding Student Presentation Award <i>19th Conference on Mesoscale Processes</i>	2022
NASA Group Achievement Award (CAMP ² Ex)	2020
St. Ignatius de Loyola Award <i>ADMU, for outstanding performance of a graduating student</i>	2019
ADMU Mulry Award for Literary Excellence	2019
Loyola Schools Awards for the Arts <i>ADMU, for creative writing (nonfiction and poetry)</i>	2019
ADMU Special Award for Excellent Research in the Environmental Sciences	2019
ADMU Department of Physics Program Award	2019
International Global Atmospheric Chemistry (IGAC) Travel Grant	2018
ADMU Freshman Merit Scholarship	2014

Field and Science Team Experience

2024	Radiosonde Lead <i>Testing INCUS Methods Experiment – Suborbital prelaunch Investigations of Convective Equilibrium</i> TIME-SLICE , Fort Collins, Colorado, USA
2024 – Present	Science Team Member <i>Radiative-Convective Equilibrium Model Intercomparison Project II</i> RCEMIP-II Experiment
2023 – Present	Science Team Member <i>Radiative-Convective Equilibrium Model Intercomparison Project – Aerosol-Cloud Interactions</i> RCEMIP-ACI Experiment
2022 – Present	Science Team Member <i>NASA INvestigation of Convective UpdraftS (INCUS)</i> INCUS Mission

2023	Operations Manager <i>BioAerosols and Convective Storms – Phase II</i> BACS-II , Fort Collins, Colorado, USA
2022	Radiosonde Operator, Drone Pilot <i>BioAerosols and Convective Storms – Phase I</i> BACS-I , Fort Collins, Colorado, USA
2019	Flight Scientist, Ground Controller, Weather Forecaster <i>Cloud, Aerosol, and Monsoon Processes Philippines Experiment</i> CAMP²Ex , Clark, Philippines
2019 – 2020	Instrumentation Set-up & Maintenance <i>CAMP²Ex Weather and Composition Monitoring</i> CHECSM , Quezon City, Philippines

Teaching Experience

CSU Graduate Teaching Certificate program	2023 – 2025
Drone and radiosonde instructor for van den Heever Group	2022 – 2025
GTA for ATS620: Thermodynamics and Cloud Physics	2023

Invited Seminars/Talks

- *Seeking human fingerprints in cloud processes: Land–aerosol–cloud interactions and implications for future systems.* Department of Atmospheric and Oceanic Sciences, University of Wisconsin – Madison, WI, February 2025.
- *Aerosol breezes drive cloud and precipitation increases.* Climate Journal Club, Scripps Institute of Oceanography, University of California – San Diego, CA, February 2024.
- *Untangling anthropogenic impacts on cloud processes: New approaches to the problem of variability.* Department of Atmospheric and Oceanic Sciences, University of Wisconsin – Madison, WI, February 2024.

First-Author Conference Presentations

- **Leung, G.R.** and S.C. van den Heever, 2025. How does tropical deforestation impact convection? *Gordon Research Conference on Climate and Radiation*. Lewison, ME.
- **Leung, G.R.**, J.B. Bukowski, L.D. Grant, S.W. Freeman, P.J. Marinescu, I.T. Singh, R.S. Storer, and S.C. van den Heever, 2025. How does tropical deforestation impact convection? *Gordon Research Conference on Climate and Radiation*. Lewison, ME.
- **Leung, G.R.**, J.B. Bukowski, L.D. Grant, I.T. Singh, R.S. Storer, P.J. Marinescu, S.C. van den Heever, 2025. Convective mass flux and surface precipitation across tropical convective life cycles. *AMS 2nd Symposium on Cloud Physics*. New Orleans, LA.
***Outstanding Student Presentation Award.**
- **Leung, G.R.**, L.D. Grant, S.C. van den Heever, 2024. Contrasting cloud responses to tropical deforestation across cloud types. *AGU Fall Meeting*. Washington D.C.
- **Leung, G.R.**, J.B. Bukowski, I.T. Singh, L.D. Grant, P.J. Marinescu, S.C. van den Heever, 2024. Variability in resolution sensitivity of tropical convective mass flux. *International Conference on Clouds and Precipitation*. Jeju, South Korea.

- **Leung, G.R.**, L.D. Grant, S.C. van den Heever, 2023. Deforestation-driven changes in clouds over Southeast Asia are modulated by moisture and aerosols. *AGU Fall Meeting*. San Francisco, CA.
- S.C. van den Heever, P.J. Marinescu, **Leung, G.R.***, N.M. Falk, L.D. Grant, S.M. Saleeby, 2023. Aerosol impacts on convective cold pools. *AGU Fall Meeting*. San Francisco, CA. *delivered on behalf of S.C. van den Heever.
- **Leung, G.R.**, S.C. van den Heever, 2023. “Aerosol breezes” from mesoscale aerosol gradients drive precipitation increases. *AMS 3rd Symposium on Mesoscale Processes*. Denver, CO.
- **Leung, G.R.**, S.C. van den Heever, 2022. Thermal circulations and precipitation increases driven by mesoscale aerosol gradients. *AMS 16th Conference on Cloud Physics*. Madison, WI.
- **Leung, G.R.**, S.C. van den Heever, 2022. Updraft structure and detrainment in transient and terminal congestus clouds. *AMS 19th Conference on Mesoscale Processes*. Virtual. ***Outstanding Student Presentation Award.**
- **Leung, G.R.**, S.C. van den Heever, J.S. Reid, 2021. Convective transport and midlevel detrainment from congestus clouds. *AGU Fall Meeting*. New Orleans, LA.
- **Leung, G.R.**, [and co-authors], 2018: Volatile organic compound emissions in the South China Sea during the 2011 *Vasco* cruise: sources, emission rates, and ozone formation. *15th International Global Atmospheric Chemistry (IGAC) Science Conference*. Takamatsu, Japan.
- **Leung, G.R.**, [and co-authors], 2018: Volatile organic compound emissions in the South China Sea during the 2011 *Vasco* cruise: emission ratios and source apportionment. *AOGS 14th Annual Meeting*. Singapore.

Service/Outreach Activities

<i>NASA Early Career Program AGU Town Hall</i> , speaker	2024
<i>CSU/CIRA Anti-Racism Book Club</i> , organizer/facilitator	2024 – 2025
<i>Journal of Geophysical Research: Atmospheres</i> , reviewer	2024 – Present
<i>Journal of Hydrometeorology</i> , reviewer	2024 – Present
<i>Atmospheric Chemistry and Physics</i> , reviewer	2023 – Present
<i>CSU/CIRA Diversity, Equity, and Inclusion Committee</i> , member	2022 – 2024
<i>CSU Graduate Students of Color</i> , member	2022 – 2025
<i>CSU Little Shop of Physics</i> , science demonstration volunteer	2022 – 2024
<i>CSU ATS International Student and Scholar Association</i> , board	2022 – 2023
<i>The Mind Museum</i> , science communicator	2018 – 2019