

## Gabrielle “Bee” Leung

### Contact Information

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### Research Interests

cloud physics, mesoscale meteorology, land–aerosol–cloud interactions, diurnal cycle of convection, cloud feedbacks on climate, atmospheric modeling, satellite meteorology

### Education

2025	Ph.D. in Atmospheric Science <b>Colorado State University</b> (CSU), Fort Collins, CO, USA <i>Dissertation Title:</i> “Aerosol and Land Surface Impacts on Tropical Convective Processes”
2022	M.S. in Atmospheric Science <b>Colorado State University</b> (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. in Physics, minor in Creative Writing <i>magna cum laude</i> <b>Ateneo de Manila University</b> (ADMU), Quezon City, Philippines <i>Thesis Title:</i> “Atmospheric Tracer Composition over the West Philippine Sea: Volatile Organic Compound Sources, Transport, and Impacts”

### Academic Appointments and Research Experience

2025 – Present	Anna Julia Cooper Postdoctoral Fellow* * Incoming Assistant Professor (beginning August 2026) Department of Atmospheric and Oceanic Sciences Affiliate: Center for Climatic Research, Nelson Institute for Environmental Research <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 &amp; 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

*Climatology Laboratory*

Tokyo Metropolitan University, Tokyo, Japan

**Grant and Fellowship Funding**

NASA FINESST

2022

*Future Investigators in NASA Earth and Space Science and Technology Fellowship*

CSU Walter Scott Jr. College of Engineering Graduate Fellowship

2020

**Publications**

14. **Leung, G.R.** and S.C. van den Heever: Deforestation impacts on clouds and precipitation over Borneo vary across the diurnal cycle. In review at *J. Geophys. Res. Atmos.*
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 *Atmos. Sci. 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? *J. Atmos. Sci.* doi: 10.1175/JAS-D-24-0136.1
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 (CAMP<sup>2</sup>Ex). *Bull. Am. Metero. Soc.* doi: 10.1175/BAMS-D-21-0285.1
5. Collado, J.T., [and co-authors, including **G.R. Leung**], 2023. Spatiotemporal assessment of PM2.5 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.**, 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

Maria Silva Dias Award	2025
<i>CSU Department of Atmospheric Science, for best publication based on dissertation work</i>	
AMS Outstanding Student Presentation Award	2025
<i>2<sup>nd</sup> Symposium of Cloud Physics</i>	
JPL Center for Climate Sciences Summer School participant	2023
Herbert Riehl Memorial Award	2023
<i>CSU Department of Atmospheric Science, for best publication based on thesis work</i>	
David L. Dietrich Honorary Scholarship	2022
<i>CSU Department of Atmospheric Science, for outstanding aerosol &amp; air quality research</i>	
AMS Outstanding Student Presentation Award	2022
<i>19<sup>th</sup> Conference on Mesoscale Processes</i>	
NASA Group Achievement Award (CAMP <sup>2</sup> Ex)	2020
St. Ignatius de Loyola Award	2019
<i>ADMU, for outstanding performance of a graduating student</i>	
ADMU Mulry Award for Literary Excellence	2019
Loyola Schools Awards for the Arts	2019
<i>ADMU, for creative writing (nonfiction and poetry)</i>	
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

*Testing INCUS Methods Experiment – Suborbital prelaunch  
 Investigations of Convective Equilibrium  
 TIME-SLICE, Fort Collins, Colorado, USA*

2024 – Present	Science Team Member <i>Radiative-Convective Equilibrium Model Intercomparison Project II      RCEMIP-II Experiment</i>
2023 – Present	Science Team Member <i>Radiative-Convective Equilibrium Model Intercomparison Project –      Aerosol-Cloud Interactions      RCEMIP-ACI Experiment</i>
2022 – Present	Science Team Member <i>NASA INvestigation of Convective UpdraftS (INCUS)      INCUS Mission</i>
2023	Operations Manager <i>BioAerosols and Convective Storms – Phase II      BACS-II, Fort Collins, Colorado, USA</i>
2022	Radiosonde Operator, Drone Pilot <i>BioAerosols and Convective Storms – Phase I      BACS-I, Fort Collins, Colorado, USA</i>
2019	Flight Scientist, Ground Controller, Weather Forecaster <i>Cloud, Aerosol, and Monsoon Processes Philippines Experiment      CAMP<sup>2</sup>Ex, Clark, Philippines</i>
2019 – 2020	Instrumentation Set-up & Maintenance <i>CAMP<sup>2</sup>Ex Weather and Composition Monitoring      CHECSM, Quezon City, Philippines</i>

### Teaching and Mentoring Experience

UW–Madison Research Mentor Training	2025
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

- *Seeing the forest for the trees: How spatial patterns in land–aerosol–atmosphere interactions shape cloud responses.* Department of Earth, Ocean & Atmospheric Science, Florida State University, Tallahassee, FL, September 2025.
- *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*. Lewiston, 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. Resolving convective mass flux across environments and storm organization. *Gordon Research Conference on Climate and Radiation*. Lewiston, 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 2<sup>nd</sup> 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 3<sup>rd</sup> 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 16<sup>th</sup> 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 19<sup>th</sup> 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. *15<sup>th</sup> 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 14<sup>th</sup> Annual Meeting*. Singapore.

## Service/Outreach Activities

### *Journal Reviewer*

Monthly Weather Review, Journal of Geophysical Research: Atmospheres,  
Journal of Hydrometeorology, Atmospheric Chemistry and Physics

### *Grant Reviewer*

National Science Foundation (NSF)

<i>NASA Early Career Program AGU Town Hall</i> , speaker	2024
<i>CSU/CIRA Anti-Racism Book Club</i> , organizer/facilitator	2024 – 2025
<i>CSU/CIRA Diversity, Equity, and Inclusion Committee</i> , member	2022 – 2024
<i>CSU ATS/van den Heever group</i> , outreach participant and lead	2022 – 2025
<i>CSU ATS International Student and Scholar Association</i> , board	2022 – 2023
<i>The Mind Museum</i> , science communicator	2018 – 2019