

# Adele L Igel

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Former Name: Adele M Lichtenberger

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## Education

2015	PhD Atmospheric Science	Colorado State University
2012	MS Atmospheric Science	Colorado State University
2010	BS Meteorology	North Carolina State University
	BS Physics	

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## Ph.D. Dissertation and M.S. Thesis

2015	A Theoretical and Numerical Investigation of Warm-Phase Microphysical Processes
2012	Latent Heating and Cloud Processes in Warm Fronts

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## Academic Positions

2016 - present	Assistant Professor, University of California, Davis
2012	Postdoctoral Researcher, Colorado State University

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## Honors and Awards

2019	Editor's Citation for Excellence in Refereeing for <i>Journal of Advances in Modeling Earth Systems</i>
2019	American Meteorological Society Editor's Award for <i>Journal of Atmospheric Science</i>
2017	Editor's Citation for Excellence in Refereeing for <i>JGR-Atmospheres</i>
2015	Alumni Award (CSU Department of Atmospheric Science best publication based on dissertation work)
2013	Herbert Riehl Memorial Award (CSU Department of Atmospheric Science best publication based on thesis work)
2011	NSF Graduate Research Fellowship
2010	AMS Graduate Student Fellowship

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## **Funding**

- 2020- Office of Naval Research  
2023 Young Investigator Program  
“Microphysical Modeling and Detection of Marine Fog”
- 2019- National Science Foundation  
2020 “EAGER: Development of a Bulk-Emulating Microphysics Scheme”
- 2018- Department of Energy  
2021 “Dissipation of Mixed-Phase Arctic Clouds and Its Relationship to Aerosol Properties”
- 2014 NSF Graduate Research Opportunities Worldwide (GROW). I was awarded funds from the NSF and the Swedish Research Council based on a research proposal to work for three months at the University of Stockholm with Dr. Annica Ekman.
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## **Teaching**

- ATM128: Atmospheric Radiation and Satellite Meteorology  
ATM120: Atmospheric Thermodynamics and Cloud Physics  
ATM244: Cloud and Precipitation Physics
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## **Mentoring**

### **PhD Students:**

- Lucas Sterzinger, in progress  
Arthur Hu, in progress

### **MS Students:**

- Shuang (Lea) Tong, 2019  
Amy Yu, 2019

### **Undergraduate Interns:**

- Abigail Williams, 2020  
Christopher Appel, 2020  
Evan Harris, 2020  
Laurence Fu, 2019  
Nicholas Falk, 2018  
Qinxue Gu, 2017  
Emily Parker, 2013
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## **Professional Organizations**

- American Meteorological Society (AMS)  
American Geophysical Union (AGU)
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## **Service and Outreach**

- 2019- Member, AMS Committee on Cloud Physics  
present

- 2018-present Associate Editor for *Journal of the Atmospheric Sciences*
- 2018-2020 Co-chair of the Symposium on Aerosol-Cloud-Climate Interactions at the AMS Annual Meeting
- 2017 - 2018 Co-chair of the Deep Convection and Aerosol Interactions Session of the Aerosol-Cloud-Climate Interactions Symposium at the AMS Annual Meeting
- 2017-present Member, AMS Committee on Atmospheric Chemistry
- 2017 AggieMentors science fair judge
- 2017 Speaker at the AMS Student Conference about webpage design
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## Publications Reviewed

*Atmospheric Chemistry and Physics*  
*Boundary Layer Meteorology*  
*Geophysical Research Letters*  
*Journal of Advances in Modeling Earth Systems*  
*Journal of Applied Meteorology and Climatology*  
*Journal of the Atmospheric Sciences*  
*Journal of Geophysical Research – Atmospheres*  
*Journal of Hydrometeorology*  
*Monthly Weather Review*  
*Nature Partner Journals: Climate and Atmospheric Science*  
*Science*

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## Publications

h-Index: 9 (Citation information from Google Scholar and Kudos.)

\* Undergraduate Student

*In Review:*

1. Bulatovic, I., A. L. Igel, C. Leck, J. Heintzenberg, I. Riipinen, and A. M. L. Ekman, 2020: The importance of Aitken mode aerosol particles for cloud sustenance in the summertime high Arctic: A simulation study supported by observational data. Submitted to *Atmospheric Chemistry and Physics*.

*Published or in Press:*

1. Park, J. M., S. C. van den Heever, **A. L. Igel**, L. D. Grant, J. S. Johnson, S. M. Saleeby, S. D. Miller, and J. S. Reid, 2020: Environmental Controls on Tropical Sea Breeze Convection and Resulting Aerosol Redistribution. *J. Geophys. Res.*, 125, e2019JD031699, doi:10.1029/2019JD031699.

2. **A. L. Igel**, 2019: Using an Arbitrary Moment Predictor to Investigate the Optimal Choice of Prognostic Moments in Bulk Cloud Microphysics Schemes. *J. Adv. Model. Earth Sys.*, 11, 4559-4575, doi: 10.1029/2019MS001733.
3. \*Falk, N. M., **A. L. Igel**, and M. R. Igel, 2019: The Relative Impact of Ice Fall Speeds and Microphysics Parameterization Complexity on Supercell Evolution. *Monthly Weather Review*, 147, 2403-2415. doi: 10.1175/MWR-D-18-0417.1. (2 citations)
4. Freeman, S. W., **A. L. Igel**, and S. C. van den Heever, 2019: Relative sensitivities of rainfall prediction to fixed shape parameters and collection efficiencies. *Q. J. Roy. Meteor. Soc.*, 145, 2181-2201, doi:10.1002/qj.3550.
5. Nelson, E. L., T. S. L'Ecuyer, **A. L. Igel** and S. C. van den Heever, 2019: An interactive online educational applet for multiple frequencies of active remote sensing observations in the climate system. *Bull. Amer. Meteor. Soc.*, 101, 747-751, doi: 10.1175/BAMS-D-18-0249.1.
6. Igel, M. R. and **A. L. Igel**, 2018: The energetics and magnitude of hydrometeor friction in clouds. *J. Atmos. Sci.*, 74, 1343-1350, doi: 10.1175/JAS-D-17-0285.1. (1 citation)
7. **Igel, A. L.**, S. C. van den Heever, and J. S. Johnson, 2018: Meteorological and land surface properties impacting sea breeze extent and aerosol distribution in a dry environment. *J. Geophys. Res.*, 123, 22-37, doi: 10.1002/2017JD027339. (11 citations)
8. **Igel, A. L.**, A. M. L. Ekman, C. Leck, M. Tjernström, J. Savre, and J. Sedlar, 2017: The free troposphere as a potential source of Arctic boundary layer aerosol particles. *Geophys. Res. Lett.* 44, 7053-7060, doi:10.1002/2017GL073808. Editor highlight and issue cover article. (10 citations)
9. **Igel, A. L.** and S. C. van den Heever, 2017: The importance of cloud droplet size distributions in shallow cumulus clouds. Part I: Bin microphysics simulations. *J. Atmos. Sci.*, 74, 249-258 doi:10.1175/JAS-D-15-0382.1. (17 citations)
10. **Igel, A. L.** and S. C. van den Heever, 2017: The importance of cloud droplet size distributions in shallow cumulus clouds. Part II: Bulk microphysics simulations. *J. Atmos. Sci.*, 74, 259-273, doi:10.1175/JAS-D-15-0383.1. (13 citations)
11. **Igel, A. L.**, and S. C. van den Heever, 2017: The role of the gamma function shape parameter in determining differences between condensation rates in bin and bulk microphysics schemes. *Atmos. Chem. Phys.* 17, 4599-4609, doi:10.5194/acp-17-4599-2017 (7 citations).
12. **Igel, A. L.**, M. R. Igel, and S. C. van den Heever, 2015: Make it a double? Sobering results from single- and double-moment microphysics simulations, *J. Atmos. Sci.*, 72, 910-925. doi: 10.1175/JAS-D-14-0107.1. **(72 citations)**

13. **Igel, A. L.**, S. C. van den Heever, 2014: The role of latent heating in warm frontogenesis. *Q. J. Roy. Meteor. Soc.* 140, 139-150. doi:10.1002/qj.2118. (17 citations)
14. **Igel, A. L.**, S. C. van den Heever, C. M. Naud, S. M. Saleeby, and D. J. Posselt, 2013: Sensitivity of warm frontal processes to cloud-nucleating aerosol concentrations. *J. Atmos. Sci.* 70, 1768-1783, doi:10.1175/JAS-D-12-0170.1. **(43 citations)**
15. Fallest, D. W., **A. M. Lichtenberger**, C. J. Fox, and K. E. Daniels, 2010: Fluorescent visualization of a spreading surfactant. *New J. Phys.* 12, 073029. (47 citations)
16. Meskhidze, N., L. A. Remer, S. Platnick, R. N. Juarez, **A. M. Lichtenberger**, and A. R. Aiyyer 2009: Exploring the differences in cloud properties observed by the Terra and Aqua MODIS Sensors, *Atmos. Chem. Phys.*, 9, 3461-3475. (33 citations)

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## Invited Lectures

1. Department of Marine, Earth, and Atmospheric Science, North Carolina State University, Raleigh, NC, September 2018.
2. Naval Research Laboratory, Monterey, CA, July 2019
3. Berkeley Atmospheric Sciences Center, University of California, Berkeley, CA September 2019

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## Selected Conference and Workshop Presentations

(Underlined name indicates presenter.)

1. **A. L. Igel**, L. Sterzinger, S. Tong, and J. Sedlar (2020) The impact of boundary layer and free-troposphere aerosol particles on Arctic low-level clouds, AMS 100<sup>th</sup> Annual Meeting, Boston, MA. (O)
2. Hu, Z. A. and **A. L. Igel** (2019) The existential crisis of aerosol: Irrelevance to relative dispersion of the droplet size distribution? AGU Fall Meeting, 2019, San Francisco, CA. (P)
3. Sterzinger, L. and **A. L. Igel** (2019) Effect of ice habit on modeled predictions of orographic precipitation, AGU Fall Meeting, 2019, San Francisco, CA. (P)
4. **Igel, A. L.**, A. Yu, and L. Fu (2019) An Investigation of Proposed Aerosol Indirect Effect Mechanisms in Deep Convection, MAC-MAQ Meeting, Davis, CA. (O)
5. Tong, S., **A. L. Igel**, and J. Sedlar (2019) Impacts of aerosol concentration on the dissipation of Arctic clouds, 15<sup>th</sup> Conference on Polar Meteorology and Oceanography, Boulder, CO. (P)

6. **Igel, A. L.** (2019) Using a New Hybrid Bulk-Bin Method to Improve Cloud Microphysics Parameterizations. European Geophysical Union Annual Meeting, Vienna, Austria. (PICO)
7. **Igel, A. L.** (2019) Influences of Free Tropospheric and Boundary Layer Aerosol on Low-Level Mixed-Phase Clouds. QUIEscenT workshop, Cambridge, UK. (P)
8. **Igel, A. L.**, A. Yu and S. C. van den Heever (2019) Mechanisms of aerosol-induced invigoration in deep convective storms. AMS 99<sup>th</sup> Annual Meeting, Phoenix, AZ. (O)
9. **Igel, A. L.** (2018) Box model results from a bulk-emulating microphysics scheme. AGU Fall Meeting, 2018, Washington, DC. (P)
10. **Sterzinger, L.** and **A. L. Igel** (2018) Effects on ice habit on Sierra Nevada snowfall and implications for climate change. AGU Fall Meeting, 2018, Washington, DC. (P)
11. **Igel, A. L.** (2018) Buying Clouds in Bulk? Strengths and Limitations of Bulk Microphysics Parameterizations of Warm Phase Processes. AMS 15<sup>th</sup> Conference on Cloud Physics, 9-13 July 2018, Vancouver, BC. (O)
12. **Igel, A. L.**, A. M. L. Ekman, C. Leck, M. Tjernström, J. Savre, and J. Sedlar (2018) Boundary layer aerosol sources and cloud interactions in the summertime remote Arctic. AMS 98<sup>th</sup> Annual Meeting, 7-11 January 2018, Austin, TX. (O)
13. **Igel, A. L.** (2017), The spectral shape of cloud droplet size distributions and its relationships to cloud properties and aerosol-cloud interactions. AGU Fall Meeting, 11-15 December 2017, New Orleans, LA. (O; Invited)
14. **Igel, A. L.**, S. C. van den Heever, J. S. Johnson, and J. Park (2017), Pollution Transport in Sea Breeze Circulations. Meteorology and Climate – Modeling for Air Quality Conference, 13-15 September 2017, Davis, CA (P).
15. **Igel, A. L.** (2017), Cloud droplet size distribution width and aerosol relationships in warm-phase clouds. AMS 97<sup>th</sup> Annual Meeting, 23-26 January 2017, Seattle, WA. (O)
16. **Park, J.**, **A. L. Igel**, and S. C. van den Heever (2017), Controls on the redistribution of coastal zone aerosols in convective clouds associated with sea breeze circulations. AMS 97<sup>th</sup> Annual Meeting, 23-26 January 2017, Seattle, WA. (O)
17. **Igel, A. L.** (2016), Cloud droplet size distribution width and number concentration relationships in warm-phase clouds. AGU Fall Meeting, 12-16 December 2016, San Francisco, CA. (O)

18. Igel, M. R. and **A. L. Igel** (2016), The energetics and consequences of hydrometeor frictional heating in clouds. AGU Fall Meeting, 12-16 December 2016, San Francisco, CA. (P)
19. Solbrig, J. E., S. D. Miller, S. C. van den Heever, S. M. Kreidenweis, J. Zhang, R. Holz, M. Zupanski, J. Wang, M. M. Oo, S. C. Albers, S. A. Atwood, **A. L. Igel**, A. Kliwer (2016), Advancing littoral zone aerosol prediction via holistic studies in regime-dependent flows. AGU Fall Meeting, 12-16 December 2016, San Francisco, CA. (P)
20. **Igel, A. L.**, A. M. L. Ekman, C. Leck, J. Savre, M. Tjernström, and J. Sedlar (2016), The Free Troposphere as a Source of Arctic Boundary Layer Aerosol, European Aerosol Conference, 4-9 September 2016, Tours, France.
21. **Igel, A. L.**, J. Park, S. C. van den Heever, J. S. Johnson, and K. Carslaw (2016), Controls on the Characteristics of Convective Clouds Associated with Sea Breeze Circulations. International Conference on Clouds and Precipitation, 25-29 July 2016, Manchester, UK. (O)
22. **Igel, A. L.** and S. C. van den Heever (2016), The Impact of the Cloud Droplet Size Distribution Shape Parameter on Evaporation and Cloud Fraction. International Conference on Clouds and Precipitation, 25-29 July 2016, Manchester, UK. (P)
23. Freeman, S., S.C. van den Heever, and **A. L. Igel** (2016), Does the shape of the assumed raindrop size distribution matter in convection?. International Conference on Clouds and Precipitation, 25-29 July 2016, Manchester, UK. (O)
24. **Igel, A. L.**, S. C. van den Heever, J. Park, S. Atwood, and S. Kreidenweis (2016), Predicting littoral zone aerosol optical properties under a sea breeze regime: Part II. Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, Optical Society of America Meeting, 27-29 June 2016, Washington, D.C. (Invited)
25. **Igel, A. L.** and S. C. van den Heever (2016), The cloud droplet relative dispersion effect – Does it exist? AMS 96<sup>th</sup> Annual Meeting, 10-14 January 2016, New Orleans, LA. (P)
26. **Igel, A. L.**, A. M. L. Ekman, C. Leck, J. Savre, M. Tjernström, and J. Sedlar (2015), The influence of free tropospheric aerosol on the boundary layer aerosol budget in the Arctic. AGU Fall Meeting, 14-18 December 2015, San Francisco, CA. (O)
27. **Igel, A. L.**, and S. C. van den Heever (2014), Investigation of the gamma distribution shape parameter in shallow cumulus clouds. AGU Fall Meeting, 15-19 December 2014, San Francisco, CA. (P)
28. **Igel, A. L.** and S. C. van den Heever (2014), A comparison of bin-emulating and spectral bin microphysics schemes in RAMS. AMS 14<sup>th</sup> Conference on Cloud Physics, 7-11 July 2014, Boston, MA. (P)

29. van den Heever, S. C. and **A. L. Igel** (2014), Aerosol impacts on deep convective processes using bulk and bin microphysical schemes. AMS 14<sup>th</sup> Conference on Cloud Physics, 7-11 July 2014, Boston, MA. (P)
30. **Igel, A. L.** and S. C. van den Heever (2014), Aerosol impacts in shallow convection as simulated by bin and bulk microphysical schemes in RAMS. AMS 94<sup>th</sup> Annual Meeting, 2-6 February 2014, Atlanta, GA. (O)
31. Parker, E., **Igel, A. L.** and S. C. van den Heever (2013), The impact of one- and two-moment microphysical schemes on precipitation in an ordinary thunderstorm. *AGU Fall Meeting*, San Francisco, CA. (P)
32. **Igel, A. L.**, S. C. van den Heever, C. M. Naud, S. M. Saleeby, and D. J. Posselt (2013), Impacts of cloud condensation nuclei on deep stratus clouds. 19<sup>th</sup> International Conference on Nucleation and Atmospheric Aerosols, Fort Collins, CO. (O)
33. **Igel, A. L.**, S. C. van den Heever, S.M. Saleeby, C.M. Naud, and D.J. Posselt, (2012), Warm frontal cloud response to cloud-nucleating aerosols, AGU Fall Meeting, 3-7 December 2012, San Francisco, CA. (P)
34. **Igel, A. L.**, S. C. van den Heever, S. M. Saleeby, C. M. Naud, and D. J. Posselt, (2011), Indirect effects of aerosols on warm frontal processes, 14<sup>th</sup> Conf. on Mesoscale Processes (O)
35. Posselt, D., C. Naud, S. van den Heever, and **A. Lichtenberger**, (2010), A-Train-Based examination of the relationship between aerosols, cloud vertical structure, and cloud radiative forcing in midlatitude cyclones, A-Train Symposium (P)
36. **Lichtenberger, A. M.**, W. J. Shaw, L. K. Berg, C. M. Berkowitz, J. A. Ogren, and E. Andrews, (2008), Digital inversion and initial analysis of nephelometer data from the CHAPS campaign, Eos Trans. AGU, 89(53), Fall Meet. Suppl. (P)
37. **Lichtenberger, A. M.**, and S. Zubrick, (2007), A comparison of precipitable water measurements from radiosondes, ground-based GPS receivers and GOES sounders., NWA Annual Meet. (P)

## Other Presentations

**Igel, A. L.** (2017), Tools of the Trade – Web Development, AMS Annual Meeting Student Conference, 21-22 January 2017, Seattle, WA. (Invited)