

# YI MING

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### Education

**Ph.D.** in Civil and Environmental Engineering, **Princeton University** 2003  
**Certificate** in Science and Environmental Policy  
Woodrow Wilson School of Public and International Affairs, **Princeton University** 2003  
**B.E.** in Chemical Engineering (with a **second B.E.** in Environmental Engineering)  
**Tsinghua University**, Beijing, China 1998

### Employment

**Head** of Atmospheric Physics and Climate Group (10/12-Present), **Physical Scientist**  
(11/10-Present), **Project Scientist II** (8/05-10/10), **Visiting Scientist** (10/03-07/05),  
Geophysical Fluid Dynamics Laboratory/NOAA  
**Lecturer**, Program in Atmospheric and Oceanic Sciences (AOS), Department of  
Geosciences, Princeton University 7/13-Present  
**Postdoctoral Researcher**, Department of Chemistry, University of Delaware 11/02-9/03  
**Research Assistant**, Atmospheric Aerosol Group, Princeton University 09/98-10/02

### Honors

American Meteorological Society (AMS) Henry G. Houghton Award 09/14  
Department of Commerce Group Gold Medal for Scientific Achievement 10/12  
World Meteorological Organization (WMO) Norbert Gerbier-MUMM International  
Award 7/12  
Presidential Early Career Award for Scientist and Engineers (PECASE) - "*The highest  
honor bestowed by the U.S. government on outstanding scientists and engineers  
beginning their independent careers*" 12/08  
National Science Foundation (NSF) Science Policy Fellowship 9/00-6/03  
First-Grade Prize, National Challenge Cup Science and Technology Competition for  
College Students 5/97

### Professional Experience

**Review Panelist**, NOAA/Atmospheric Composition and Climate (ACC), DOE/Regional  
and Global Climate Modeling Program, DOE/Atmospheric Science Research (ASR)  
Program, Lawrence Berkeley National Laboratory (LBNL) Climate Science Focus Area  
Review, Pacific Northwest National Laboratory (PNNL) Climate Science Focus Area  
Review, SciDAC, NASA/ Atmospheric Composition Modeling and Analysis Program  
(ACMAP), Romanian National Research Council (declined)  
**Grant Reviewer**, European Research Council, DOE/Atmospheric Science Program  
(ASP), Atmospheric Radiation Measurement (ARM), Atmospheric System Research  
(ASR), National Science Foundation (NSF), Canadian Foundation for Climate and  
Atmospheric Sciences (CFCAS), Israel Science Foundation (ISF), Research Council of  
Norway

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**Tenure/Promotion Reviewer** for a number of universities and institutes

**Journal Reviewer** for *Nature*, *Nature Geoscience*, *Nature Climate Change*, *Science*, *Proceedings of the National Academy of Sciences*, *Journal of Geophysical Research – Atmosphere*, *Geophysical Research Letters*, *Atmospheric Chemistry and Physics*, *Tellus*, *Journal of Atmospheric Sciences*, *Journal of Climate*, *Climate Dynamics*, *Atmospheric Research*, *Atmospheric Environment*, *Journal of Applied Meteorology and Climatology*, *International Journal of Climatology*, *Theoretical and Applied Meteorology*, *Environmental Research Letters*.

**Co-convener**, 2014 2015 AGU Fall Meeting, 2013 AOGS-AGU (WPGM) Joint Assembly, 2016 AMS Annual Meeting

**Session Chair**, 2012 2013 AMS Annual Meeting, 2012 AMS Annual Meeting, 2012 EGU General Assembly

**Participant**, American Meteorological Society (AMS) Summer Policy Colloquium

**Steering Committee**, Model Development Team (MDT) of GFDL/CM4, Geophysical Fluid Dynamics Laboratory

**Core Member**, Global Atmospheric Model Development Team (GAMDT) of GFDL/CM3, Geophysical Fluid Dynamics Laboratory

**Member**, AeroCom working group of aerosol-climate simulation

**Member**, AeroCom working group of indirect effects

**Member**, Committee on cloud, chemical and climate interactions, Atmospheric Chemistry and Climate (AC&C) Initiative, WCRP/IGBP

**Member**, CLIVAR-GEWEX Working Group on Asian-Australian Monsoon (WG-AAM)

**Co-lead**, NOAA Model Diagnostics Task Force

**Member**, GFDL Award Nomination Committee

**Member**, GFDL Minority Internship Committee

**Member**, AOS Graduate Work Committee

**Vice President**, GFDL Employee Association (GFDLEA)

### Teaching Experience

**Lecturer**, AOS 527 Atmospheric Radiative Transfer, Atmospheric and Oceanic Sciences (AOS) Program, Princeton University

**Lecturer**, GEO 503 Responsible Conduct of Research in Geosciences, Department of Geosciences, Princeton University

**Lecturer**, AOS 580 Special Topics: Aerosol, Climate and Climate Change, Atmospheric and Oceanic Sciences (AOS) Program, Princeton University

### Peer-reviewed Publications

\*First-authored by students or postdocs supervised

1. **Ming, Y.**, and L.M. Russell, 2001: Predicted Hygroscopic Growth of Sea Salt Aerosol. *Journal of Geophysical Research -Atmosphere*, 106, 28259-28274.
2. Prenni, A.J., P.J. DeMott, S.M. Kreidenweis, D.E. Sherman, L.M. Russell and **Y. Ming**, 2001: The Effect of Low Molecular Weight Dicarboxylic Acids on Cloud Formation, *Journal of Physical Chemistry A*, 105, 11240-11248.

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3. **Ming, Y.**, and L.M. Russell, 2002: Thermodynamic Equilibrium of Aqueous Solutions of Organic-Electrolyte Mixtures in Aerosol Particles. *AIChE Journal*, 48, 1331.
4. Russell, L.M., and **Y. Ming**, 2002: Deliquescence of Small Particles, *Journal of Chemical Physics*, 116, 311-321.
5. **Ming, Y.**, and L.M. Russell, 2004: Organic Aerosol Effects on Fog Droplet Spectra, *Journal of Geophysical Research – Atmosphere*, 109, 10.1029/2003JD004427.
6. **Ming, Y.**, G. Lai, C. Tong, R.W. Wood, and D.J. Doren, 2004: Free Energy Perturbation Study of Water Dimer Dissociation Kinetics, *Journal of Chemical Physics*, 121, 773-777.
7. **Ming, Y.**, L.M. Russell, and D.F. Bradford, 2005: Health and Climate Policy Impacts on Sulfur Emission Control, *Review of Geophysics*, 43, doi:10.1029/2004RG000167.
8. **Ming, Y.**, V. Ramaswamy, P.A. Ginoux and L.W. Horowitz, 2005: Geophysical Fluid Dynamics Laboratory General Circulation Model Investigation of the Indirect Radiative Effects of Anthropogenic Sulfate Aerosol, *Journal of Geophysical Research - Atmosphere*, 110, doi:10.1029/2005JD006161.
9. **Ming, Y.**, V. Ramaswamy, P.A. Ginoux and L.W. Horowitz, 2005: Direct Radiative Forcing of Anthropogenic Organic Aerosols, *Journal of Geophysical Research - Atmosphere*, 110, doi:10.1029/2004JD005573.
10. **Ming, Y.**, V. Ramaswamy, L.J. Donner, and V.T.J. Phillips, 2006: A New Parameterization of Cloud Droplet Activation Applicable to General Circulation Models, *Journal of the Atmospheric Sciences*, 63, 1348-1356.
11. **Ming, Y.**, V. Ramaswamy, L.J. Donner, V.T.J. Phillips, S.A. Klein, P.A. Ginoux, and L.W. Horowitz, 2007: Modeling the Interactions between Aerosols and Liquid Water Clouds with a Self-consistent Cloud Scheme in a General Circulation Model, *Journal of the Atmospheric Sciences*, 64, 1189-1209.
12. Lee, S. S., L. J. Donner, V. T. J. Phillips, and **Y. Ming**, 2008: Examination of aerosol effects on precipitation in deep convective clouds during the 1997 ARM summer experiment. *Quarterly Journal of the Royal Meteorological Society*, 134, 1201-1220.
13. Lee, S.S., L.J. Donner, V.T.J. Phillips, and **Y. Ming**, 2008: The dependence of aerosol effects on clouds and precipitation on cloud-system organization, shear and stability. *Journal of Geophysical Research*, 113, doi:10.1029/2007JD009224.
14. **Ming, Y.**, and V. Ramaswamy, 2009: Nonlinear Climate and Hydrological Responses to Aerosol Effects. *Journal of Climate*, 22, 1329-1339.
15. Magi, B. I., P. A. Ginoux, V. Ramaswamy, and **Y. Ming**, 2009: Evaluation of Tropical and Extratropical Southern Hemisphere African Aerosol Properties Simulated by a Climate Model. *Journal of Geophysical Research – Atmosphere*, 114, doi:10.1029/2008JD011128.
16. Quaas, J., **Y. Ming**, and coauthors, 2009: Aerosol Indirect Effects – General Circulation Model Intercomparison and Evaluation with Satellite Data. *Atmospheric Chemistry and Physics*, 9, 8697-8717.
17. **Ming, Y.**, V. Ramaswamy, and G. Persad, 2010: Two Opposing Effects of Absorbing Aerosols on Global-mean Precipitation. *Geophysical Research Letters*, 37, doi:10.1029/2010GL042895.
18. Salzmann, M, **Y. Ming**, J.-C. Golaz, P.A. Ginoux, H. Morrison, A. Gettelman, M. Krämer, and L.J. Donner, 2010: Two-moment Bulk Stratiform Cloud Microphysics in

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- the GFDL AM3 GCM: Description, Evaluation, and Sensitivity Tests. *Atmospheric Chemistry and Physics*, 10, 8037-8064.
19. Shindell, D., M. Schulz, **Y. Ming**, T. Takemura, G. Faluvegi, and V. Ramaswamy, 2010: Spatial Scales of Climate Response to Inhomogeneous Radiative Forcing. *Journal of Geophysical Research – Atmosphere*, 115, doi:10.1029/2010JD014108.
  20. Chen, G., **Y. Ming**, N. Singer, and J. Lu, 2010: Aerosol-induced Changes in Mean and Extreme Precipitation. *Geophysical Research Letters*, 38, doi:10.1029/2010GL046435.
  21. Donner, L.J., B. Wyman, R.S. Hemler, L.W. Horowitz, **Y. Ming**, and coauthors, 2010: The Dynamical Core, Physical Parameterizations, and Basic Simulation Characteristics of the Atmospheric Component of the GFDL Global Coupled Model CM3. *Journal of Climate*, 24, doi:10.1175/2011JCLI3955.1.
  22. Golaz, J.-C., M. Salzmann, L.J. Donner, L.W. Horowitz, **Y. Ming**, and M. Zhao, 2010: Sensitivity of the Aerosol Indirect Effect to Subgrid Variability in the Cloud Parameterization of the GFDL Atmosphere General Circulation Model AM3. *Journal of Climate*, 24, doi:10.1175/2010JCLI3945.1.
  23. **Ming, Y.**, and V. Ramaswamy, 2011: A Model Investigation of Aerosol-induced Changes in Tropical Circulation. *Journal of Climate*, doi:10.1175/2011JCLI4108.1.
  24. **Ming, Y.**, V. Ramaswamy, and G. Chen, 2011: A Model Investigation of Aerosol-induced Changes in Boreal Winter Extratropical Circulation. *Journal of Climate*, doi:10.1175/2011JCLI4111.1.
  25. Ghan, S.J., H. Abdul-Razzak, **Y. Ming**, X. Liu, M. Ovchinnikov, A. Nenes, N. Meskhidze, J. Xu, and X. Shi, 2011: Droplet Nucleation: Physically-Based Parameterization and Validation. *Journal of Advances in Modeling Earth Systems*, doi:10.1029/2011MS000074.
  26. Bollasina\*, M.A., **Y. Ming**, and V. Ramaswamy, 2011: Anthropogenic Aerosols and the Weakening of the South Asian Monsoon. *Science*, doi:10.1126/science.1204994.
  27. Persad\*, G., **Y. Ming**, and V. Ramaswamy, 2012: Tropical Tropospheric-only Responses to Absorbing Aerosols. *Journal of Climate*, 25(7), doi:10.1175/JCLI-D-11-00122.1.
  28. Bollasina\*, M.A., and **Y. Ming**, 2012: Precipitation Bias over the Western Indian Ocean in an Atmospheric GCM: Role of the Meridional SST Gradient. *Climate Dynamics*, doi:10.1007/s00382-012-1347-7.
  29. Hill\*, S., and **Y. Ming**, 2012: Nonlinear climate response to regional brightening of tropical marine stratocumulus. *Geophysical Research Letters*, doi:10.1029/2012GL052064.
  30. Zhou, C., J. E. Penner, **Y. Ming**, and X. Huang, 2012: Aerosol Forcing Based on CAM5 and AM3 Meteorological Fields. *Atmospheric Chemistry and Physics Discussion*, 12, 10679-10727, doi:10.5194/acpd-12-10679-2012.
  31. Huang, X., H. Chuang, A. Dessler, X. Chen, K. Minschwaner, V. Ramaswamy, and **Y. Ming**, 2012: A radiative-convective equilibrium perspective of the weakening of tropical Walker circulation in response to global warming. *Journal of Climate*, doi:10.1175/JCLI-D-12-00288.1.
  32. Ocko, I., V. Ramaswamy, P. Ginoux, **Y. Ming**, and L. Horowitz, 2012: Sensitivity of the aerosol direct radiative forcing balance to physical climate factors. *Journal of Geophysical Research*, 117, doi:10.1029/2012JD018019.

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33. **Ming, Y.**, and V. Ramaswamy, 2012: Nonlocal component of radiative flux perturbation. *Geophysical Research Letters*, 39, doi:1029/2012GL054050.
34. S. Fan, J. P. Schwarz, J. Liu, D.W. Fahey, P. Ginoux, L. W. Horowitz, H. Levy II, **Y. Ming**, J. R. Spackman, 2012: Inferring ice formation processes from global-scale black carbon profiles observed in the remote atmosphere and model simulations. *Journal of Geophysical Research*, 117, doi:10.1029/2012JD018126..
35. Bollasina\*, M.A., and **Y. Ming**, 2012: The role of land-surface processes in modulating the Indian monsoon annual cycle. *Climate Dynamics*, doi:10.1007/s00382-012-1634-3.
36. Lin, Y., M. Zhao, V. Ramaswamy, **Y. Ming**, J.-C. Golaz, L.J. Donner, S.A. Klein, S. Xie, and M. Deng, 2013: Impact of cumulus and cloudiness parameterization on Tropical cloud, radiation and precipitation in GFDL AM2. *Journal of Climate*, doi:10.1175/JCLI-D-12-00442.1.
37. Levy II, H., L.W. Horowitz, M.D. Schwarzkopf, **Y. Ming**, J.-C Golaz, V. Naik, and V. Ramaswamy, 2013: The Roles of Aerosol Effects, both Direct and Indirect, in Past and Future Climate Change. *Journal of Geophysical Research*, doi:10.1002/jgrd.50192.
38. Zhang, R., T.L. Delworth, R. Sutton, D.L.R. Hodson, K.W. Dixon, I.M. Held, Y. Kushnir, J. Marshall, Y. Ming, and coauthors, 2013: Have Aerosols Caused the Observed Atlantic Multidecadal Variability? *Journal of Atmospheric Sciences*, doi:10.1175/JAS-D-12-0331.1.
39. Lin, Y., M. Zhao, **Y. Ming**, J.-C. Golaz, L.J. Donner, S.A. Klein, V. Ramaswamy, and S. Xie, 2013: Precipitation Partitioning, Tropical Clouds and Intraseasonal Variability in GFDL AM2. *Journal of Climate*, 26(15), doi:10.1175/JCLI-D-12-00442.1.
40. Huang, X., H. Chuang, **Y. Ming**, and G.L. Potter, 2013: A Constraint for Ice Cloud Feedback over the Tropical Pacific in Future Climate Change. Submitted to *Nature Climate Change*.
41. Bollasina\*, M.A., **Y. Ming**, and V. Ramaswamy, 2013: Earlier onset of the Indian Monsoon in the late 20th century: The role of anthropogenic aerosols. *Geophysical Research Letter*, doi: 10.1002/grl.50719.
42. Bollasina\*, M.A., **Y. Ming**, V. Ramaswamy, D. Schwarzkopf, and V. Naik, 2013: Contribution of Local and Remote Anthropogenic Aerosols to the 20th Century Weakening of the South Asian Monsoon. *Geophysical Research Letters*, 41, 680–687, doi:10.1002/2013GL058183.
43. Hill\*, S., **Y. Ming**, and I.M. Held, 2014: Mechanisms of forced tropical meridional energy flux change. *Journal of Climate*, doi:10.1175/JCLI-D-14-00165.1.
44. Persad\*, G., **Y. Ming**, and V. Ramaswamy, 2014: The Role of Aerosol Absorption in Driving Solar Dimming. *Journal of Geophysical Research*, 27(14), doi:10.1175/JCLI-D-13-00401.1.
45. Brown, P.T., L. Li, W. Li and **Y. Ming**, 2014: Unforced Top-of-Atmosphere Net Radiation Variability and its Relationship with Global Mean Surface Temperature, *Geophysical Research Letter*, 41(14), doi:10.1002/2014GL060625.
46. Ocko, I., V. Ramaswamy, **Y. Ming**, 2013: Contrasting climate responses to the scattering and absorbing features of anthropogenic aerosol forcings. *Journal of Climate*, 27(14), doi:10.1175/JCLI-D-13-00401.1.

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47. Ban-Weiss, G.A., L. Jin, S. Bauer, R. Bennartz, X. Liu, K. Zhang, **Y. Ming** and J. Jiang, 2014: Evaluating clouds, aerosols, and their interactions in three global climate models using COSP and satellite observations, *Journal of Geophysical Research*, 119(18), doi:10.1002/2014JD021722.
48. Rotstayn, L.D., E.L. Plymin, M.A. Collier, J.-J. Luo, O. Boucher, J.-L. Dufresne, M.-A. Foujols, L.W. Horowitz, S.J. Jeffrey, **Y. Ming** and K. von Salzen, 2014, Declining aerosols in CMIP5 projections: effects on atmospheric temperature structure and midlatitude jets, *Journal of Climate*, 27(18), doi:10.1175/JCLI-D-14-00258.1.
49. Lin\*, P., **Y. Ming** and V. Ramaswamy, 2015: Tropical climate change control of the lower stratospheric circulation, *Geophysical Research Letter*, 42(3), doi:10.1002/2014GL062823.
50. Zhao, M., J.-C. Golaz, I.M. Held, V. Ramaswamy, S.-J. Lin, **Y. Ming**, P.A. Ginoux, B. Wyman, L.J. Donner, D.J. Paynter, and H. Guo, 2015: Uncertainty in model climate sensitivity traced to representations of cumulus precipitation microphysics, *Journal of Climate*, doi:10.1175/JCLI-D-15-0191.1.
51. Persad\*, G., **Y. Ming**, and V. Ramaswamy, 2015: Spatially similar surface energy flux perturbations by greenhouse gases and aerosols, *Nature Communications*, in review.
52. Dong, W., Y. Lin, J.S. Wright, **Y. Ming**, and coauthors, 2016: Summer rainfall over the southwestern Tibetan Plateau controlled by deep convection over the Indian subcontinent. *Nature Communications*, 7, doi:10.1038/ncomms10925.
53. Hill\*, S., **Y. Ming**, I.M. Held and M. Zhao, 2016: A moist static energy budget-based analysis of the Sahel rainfall response to uniform oceanic warming. Submitted to *Journal of Climate*.
54. Persad\*, G., D.J. Paynter, **Y. Ming**, and V. Ramaswamy, 2016: Competing Atmospheric and Surface-Driven Impacts of Absorbing Aerosols on the East Asian Summertime Climate. Submitted to *Journal of Geophysical Research*.
55. **Ming, Y.**, and I.M. Held, 2016: Modeling Water Vapor and Clouds in an Idealized GCM. Submitted to *Journal of Climate*.
56. Lin\*, P., D.J. Paynter, **Y. Ming** and V. Ramaswamy, 2016: Changes of the tropical tropopause layer under global warming, in press.
57. Shen\*, Z., **Y. Ming**, L.W. Horowitz, I.M. Held, V. Ramaswamy, and M. Lin, 2016: On the Seasonality of Arctic Haze. Submitted to *Journal of Geophysical Research*.
58. Shen\*, Z., and **Y. Ming**, 2016: Absorbing Aerosol-Induced Changes in Extratropical Circulation in an Atmospheric General Circulation Model. To be submitted to *Journal of Climate*.
59. Brown, P.T., **Y. Ming**, W. Li and S.A. Hill, 2016: Change in the magnitude and mechanisms of unforced low-frequency surface temperature variability in a warmer climate. Submitted to *Nature Climate Change*.
60. Smyth\*, J., S.A. Hill and **Y. Ming**, 2016: Simulated response of the West African monsoon and zonal-mean tropical precipitation to Holocene orbital forcing. To be submitted to *Journal of Climate*.
61. Clark\*, S.K., **Y. Ming** and I.M. Held, 2016: The role of water vapor in the ITCZ response to hemispherically asymmetric forcings. To be submitted to *Journal of Climate*.
62. Frazer\*, M., **Y. Ming** and I.M. Held, 2016: Understanding Cloud Processes with an

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Idealized Model. To be submitted to *Journal of Climate*.

63. Chua\*, X.R. and **Y. Ming**, 2016: The effects of black carbon on tropical cyclone statistics. To be submitted to *Journal of Climate*.

### **Assessment Report**

Contributing author, *Climate Projections Based on Emissions Scenarios for Long-Lived and Short-Lived Radiatively Active Gases and Aerosols*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. H. Levy II, D.T. Shindell, A. Gilliland, M.D. Schwarzkopf, L.W. Horowitz, (eds.). Department of Commerce, NOAA's National Climatic Data Center, Washington, D.C., USA.

### **Book Chapter**

*Aerosols*. The Encyclopedia of Climate and Weather 2<sup>nd</sup> Edition. S.H. Schneider, (eds.). University of Oxford Press, New York, N.Y., USA.

### **Current Students/Postdocs Supervised**

Postdoc: Levi Silvers (Princeton), Angel Adames (Princeton)

Graduate students: Zhaoyi Shen'18 (Princeton, advisor), Michelle Frazer'19 (Princeton, advisor), Xin Rong Chua'19 (Princeton, advisor), Spencer Clark'19 (Princeton, advisor), Jane Smyth'20 (Princeton, advisor), Xiaoyuan Li (Princeton, committee), Patrick Brown (Duke, committee), Jiayi Hu (Texas A&M, committee)

### **Past Students/Postdocs Supervised**

Graduate students: Geeta Persad'16 (Princeton, advisor), Spencer Hill'16 (Princeton, advisor), Ilissa Ocko (Princeton, committee), Claire Radley (Princeton, committee)

Summer interns: Geeta Persad (Stanford), Spencer Hill (UCLA), Pranay Nadella (West Windsor-Plainsboro High School South), Colin Morgan (Cornell), Michelle Frazer (Cedarville), Jane Smyth (Yale)

Research assistant: Geeta Persad (GFDL)

Postdocs: Massimo Bollasina (Recipient of the 2013 AGU James R. Holton Junior Scientist Award, now on the faculty of the University of Edinburgh), Yuxing Yun (PNNL), Pu Lin (Associate Research Scholar, Princeton)