

Rick D. Russotto, Ph.D.

russotto@ldeo.columbia.edu
61 Route 9W, PO Box 1000
Palisades, NY 10964

CURRENT EMPLOYEMENT

Postdoctoral Research Scientist

Ocean and Climate Physics Division

Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY

June 2018—Present

Advisor: Michela Biasutti

EDUCATION

University of Washington, Seattle, WA, USA

Ph.D.: Atmospheric Sciences, June 2018

- Dissertation: *Responses of the Climate System to Opposing Solar and CO₂ Forcings*
- Advisor: Thomas Ackerman

M.S.: Atmospheric Sciences, June 2015

- Thesis: *The Effects of Ice Crystal Shape on the Evolution of Optically Thin Cirrus Clouds in the Tropics*
- Advisors: Thomas Ackerman and Dale Durran

Yale University, New Haven, CT, USA

B.S. *summa cum laude*: Geology & Geophysics, May 2012

(Atmosphere, Ocean and Climate Dynamics track)

- Senior thesis: *Microphysical Modeling of Cloud Droplet Activation over Dominica*
- Advisor: Trude Storelvmo

Deerfield Beach High School, Deerfield Beach, FL, USA

International Baccalaureate Diploma, May 2008

PEER-REVIEWED PUBLICATIONS

Russotto, R.D. and M. Biasutti (2020). **Polar Amplification as an Inherent Response of a Circulating Atmosphere: Results from the TRACMIP Aquaplanets.** *Geophysical Research Letters*, in revision.

Russotto, R.D. and T.P. Ackerman (2018). **Changes in clouds and thermodynamics under solar geoengineering and implications for required solar reduction.** *Atmospheric Chemistry and Physics*, 18, 11905–11925, doi:10.5194/acp-18-11905-2018

Russotto, R.D. and T.P. Ackerman (2018). **Energy transport, polar amplification, and ITCZ shifts in the GeoMIP G1 ensemble.** *Atmospheric Chemistry and Physics*, 18, 2287-2305, doi: 10.5194/acp-18-2287-2018.

Smyth, J.E., R.D. Russotto, and T. Storelvmo (2017). **Thermodynamic and dynamic responses of the hydrological cycle to solar dimming.** *Atmospheric Chemistry and Physics*, 17, 6439-6453, doi: 10.5194/acp-17-6439-2017.

Lenferna, A., R.D. Russotto, A. Tan, S. Gardiner, and T. Ackerman (2017). **Relevant climate response tests for stratospheric aerosol injection: A combined ethical and scientific analysis.** *Earth's Future*, 5, 577-591, doi: 10.1002/2016EF000504.

Russotto, R.D., T.P. Ackerman, and D.R. Durran (2016). **Sensitivity of thin cirrus clouds in the tropical tropopause layer to ice crystal shape and radiative absorption.** *Journal of Geophysical Research: Atmospheres*, 121, 2955-2972, doi: 10.1002/2015JD024413.

Russotto, R.D., T. Storelvmo, and R.B. Smith (2013). **Modeling aerosol activation in a tropical, orographic, island setting: Sensitivity tests and comparison with observations.** *Atmospheric Research*, 134, 12-23, doi: 10.1016/j.atmosres.2013.07.017.

FELLOWSHIPS AND GRANTS

- National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2013-2016
- Sigma Xi Grant-in-Aid of Research, 2011
- Yale University Tetelman Fellowship for International Research in the Sciences, 2011
- Yale University Richter Summer Fellowship, 2011

AWARDS AND HONORS

- University of Washington Top Scholar Award, 2012
- Distinction in the Geology & Geophysics major, 2012
- Pat Wilde Prize for Excellence in Marine Geology and Oceanography, 2012
- Elected to Phi Beta Kappa, 2011
- Deerfield Beach High School valedictorian, 2008
- National Merit Scholar, 2008
- National AP Scholar, 2008

TEACHING EXPERIENCE

University of Washington:

- Teaching Assistant (TA) for ATM S 111 (Global Warming), Autumn 2013. Taught four weekly discussion sections and held office hours. With one other TA, created section materials, homework assignments and exams. Professor: Abigail Swann.

- Lead TA for Atmospheric Sciences department, 2015-2016. Coordinated TA orientation activities, curated previous teaching materials and collected feedback on TA experience which I passed on to the department.
- Reader/Grader for ATM S 341 (Atmospheric Radiative Transfer), Spring 2017. Assigned and graded homework and held office hours to assist students with homework.

ORGANIZATIONS AND OUTREACH

- Graduate Co-President of UW American Meteorological Society student chapter, 2015-2017.
- Founding president of Club Geo, the Yale undergraduate geoscience organization. President, 2010-2011; Treasurer, 2011-2012.
- Gave lecture on “Science of Clouds and Precipitation” for local middle and high school students for the inaugural Splash at Yale event, October 2011.

CONFERENCE AND SEMINAR ORGANIZING

LDEO Ocean and Climate Physics Seminar, 2019-2020

- Co-coordinator of weekly seminar series
- Bringing in diverse group of speakers on limited budget
- Managing speaker travel logistics and meeting schedules

Graduate Climate Conference, Pack Forest, WA, 28-30 October 2016:

- Session chair, *Atmosphere: Dynamics, Clouds and Chemistry*
- Pamphlet committee chair
- Abstract evaluator

COMPUTING SKILLS

Programming (used in research):

- Python (libraries: XArray, Matplotlib, NumPy, NetCDF4)
- Matlab
- Fortran
- UNIX shell scripting
- LaTeX
- HTML

Coursework experience with:

R, Mathematica, C++, Java

Created personal website (rickrussotto.com) hosted on Amazon Web Services

Contributor to XArray open source project

WEATHER FORECASTING

- Weather Challenge (WxChallenge.com) forecaster on University of Washington team, 2012-2014. (handle: russo)
- Highest-ranked UW forecaster for Syracuse, NY (KSYR), 2012

ONLINE PROFILES AND SOCIAL MEDIA

Github: <https://github.com/rdrussotto>
Google Scholar: <https://scholar.google.com/citations?user=Gcio9nkAAAAJ&hl=en>
ORCID: <http://orcid.org/0000-0002-7981-735X>
Twitter: https://twitter.com/rick_russotto
Personal website: <http://rickrussotto.com>

TALKS

Responses of the Climate to Solar Geoengineering As Simulated by Reducing the Solar Constant. SEAS Colloquium in Climate Science, Columbia University, New York, NY, 12 September 2019.

Rapid Adjustments, Climate Feedbacks, and Polar Amplification in a Multimodel Aquaplanet Ensemble. Lamont Postdoctoral Symposium, Lamont-Doherty Earth Observatory, Palisades, NY, 11 September 2019.

Changes in the ITCZ under combined greenhouse gas and solar forcings: Insights from the Geoengineering Model Intercomparison Project. *2nd WCRP Grand Challenge Meeting on Monsoons and Tropical Rain Belts*, Trieste, Italy, 5 July 2018.

How much sunlight would you need to reflect to compensate for a quadrupling of CO₂? Atmospheric Sciences Colloquium (Ph.D. defense), University of Washington, Seattle, WA, 25 May 2018.

How much sunlight would you need to reflect to compensate for a given increase in CO₂? Seminar, Sandia National Laboratories, Albuquerque, NM, 24 Jan. 2018.

Effects of Solar Geoengineering on Clouds, Energy Transport and the ITCZ. Seminar, NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ, 13 Nov. 2017.

Effects of Solar Geoengineering on Clouds, Energy Transport and the ITCZ. Seminar, Brookhaven National Laboratory, Upton, NY, 31 July 2017.

Science Briefing: Marine Cloud Brightening. *Geoengineering Research Governance Project Workshop*, Oxford, UK, 22 June 2017.

Effects of Solar Geoengineering on Meridional Energy Transport and the ITCZ.
Seminar, University of Washington, Seattle, WA, 3 April 2017.

Effects of Solar Geoengineering on Meridional Energy Transport and the ITCZ.
American Meteorological Society Annual Meeting, Seattle, WA, 24 January 2017.

Session Introduction: Atmosphere: Dynamics, Clouds and Chemistry.
10th Graduate Climate Conference, Pack Forest, WA, 30 October 2016.

The Effects of Ice Crystal Shape on the Evolution of Optically Thin Cirrus Clouds in the Tropics. Seminar (COGS talk), University of Washington, Seattle, WA, 15 January 2015.

Effects of non-spherical ice crystal shape on modeled properties of thin Tropical Tropopause Layer cirrus. *NASA ATTREX Science Team Meeting*, Boulder, CO, 21 October 2014.

POSTER PRESENTATIONS

Russotto, R.D. and M. Biasutti. **Polar Amplification as an Inherent Response of a Circulating Atmosphere: Results from the TRACMIP Aquaplanets.** *AMS 2020 Annual Meeting*, Boston, MA, January 2020.

Russotto, R.D., and T.P. Ackerman. **How Much Sunlight Reflection is Necessary to Compensate for a Given Increase in CO₂?** *AGU 2018 Fall Meeting*, Washington, DC, December 2018.

Russotto, R.D., and T.P. Ackerman. **Changes in Clouds Under a Combined CO₂ Increase and Solar Decrease.** *AGU 2017 Fall Meeting*, New Orleans, LA, December 2017.

Russotto, R.D., T.P. Ackerman, J.E. Smyth, and T. Storelvmo. **Energy Transport, Polar Amplification, ITCZ Shifts, and Clouds in the GeoMIP G1 Ensemble.** *Gordon Research Conference on Climate Engineering*, Newry, ME, July 2017.

Russotto, R.D., T.P. Ackerman, and D.M.W. Frierson. **Effects of Solar Geoengineering on Meridional Energy Transport and the ITCZ.** *AGU 2016 Fall Meeting*, San Francisco, CA, December 2016.

Russotto, R.D., T.P. Ackerman, and D.M.W. Frierson. **Effects of Solar Geoengineering on Meridional Energy Transport and Tropical Precipitation.** *10th Graduate Climate Conference*, Pack Forest, WA, October 2016.

Russotto, R.D., T.P. Ackerman, and B. Kravitz. **A Strategy for the Use of Solar Climate Engineering.** *6th GeoMIP Workshop*, Oslo, Norway, June 2016.

Russotto, R.D., T.P. Ackerman, B. Kravitz, and S.F. Potter. **Global Climate Model Simulations of a Temporary Solar Climate Engineering Deployment.**

9th Graduate Climate Conference, Woods Hole, MA, November 2015.

Russotto, R.D., T.P. Ackerman, and D.R. Durran. **Sensitivity of Thin Tropical Cirrus Clouds to Ice Crystal Shape and Radiative Absorption.**

Gordon Research Conference on Radiation and Climate, Lewiston, ME, July 2015.

Russotto, R.D., T.P. Ackerman, and D.R. Durran. **Sensitivity of Thin Tropical Cirrus Clouds to Ice Crystal Shape and Radiative Absorption.** *Composition and Transport in the Tropical Troposphere and Lower Stratosphere Meeting, Boulder, CO, July 2015.*

Russotto, R.D., T. Storelvmo, and R.B. Smith. **Factors Controlling Droplet Concentration and Size Distribution in Clouds over Dominica.**

AGU 2011 Fall Meeting, San Francisco, CA, December 2011.

Russotto, R.D., R.A. Holman, J. Stanley, and M.L. Palmsten. **Determination of Nearshore Surface Slope Field and Wave Heights Using Optical Polarimetry.**

AGU 2010 Fall Meeting, San Francisco, CA, December 2010.

Last updated: February 6, 2020