

## Chaim I. Garfinkel

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### Education

Ph.D. Atmospheric Sciences, University of Washington, 2010, Top Scholar Award  
Title: *Stratosphere-Troposphere Coupled Variability in the Wintertime Northern Hemisphere*  
Advisor: Dennis Hartmann

M.S. Atmospheric Sciences, University of Washington, 2008  
Title: *External Sources of Interannual Variability of the Polar Vortex*

B.S. Applied and Engineering Physics, Cornell University, 2005, Dean's List, *Cum Laude* with Departmental Honors

### Research Interests

Stratosphere-troposphere interactions

Climate variability on intraseasonal to decadal time scales

The general circulation of the atmosphere

### Research Experience

<b>2013 – present</b>	Earth Science Institute Hebrew University	Senior Lecturer Golda Meir Fellow
<b>2010 – 2013</b>	Department of Earth and Planetary Sciences Johns Hopkins University	Postdoctoral Researcher Darryn Waugh
<b>2005 – 2010</b>	Department of Atmospheric Sciences University of Washington	Research Assistant Dennis Hartmann

### Teaching Experience

<b>Spring 2016</b>	Environmental Physics	Lecturer, Hebrew University
<b>Spring 2015</b>	Objective Methods of Data Analysis	Lecturer, Hebrew University
<b>Fall 2014, 2015</b>	Mid-latitude Weather Systems	Lecturer, Hebrew University
<b>Spring 2014</b>	Global Circulation and Weather Systems	Lecturer, Hebrew University
<b>Fall 2013-2015</b>	Atmosphere, Ocean, and Climate Seminars	Organizer, Hebrew University
<b>Fall 2011</b>	Survey of Earth Science	Guest Lecturer, Johns Hopkins Univ.
<b>Spring 2011</b>	Natural Disasters	Guest Lecturer, Johns Hopkins Univ.
<b>Autumn 2008</b>	Global Warming: Understanding the Debate	Teaching Assistant, Univ. of Wash.
<b>Spring 2007</b>	Introduction to Atmospheric Sciences	Teaching Assistant, Univ. of Wash.
<b>Autumn 2004</b>	Computer Instrumentation	Teaching Assistant, Cornell University

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### Refereed Publications

- 2016** Harnik N., C. I. Garfinkel, and O. Lachmy, The Influence of Jet Regimes on Extreme Weather events, In 'Dynamics and Predictability of Large-Scale, High-Impact Weather and Climate Events'. Ed. Li, J., R. Swinbank, H. Volkert and R. Grotjahn. Cambridge University Press.
- 2015** Garfinkel, C. I., V. Silverman, N. Harnik, C. Erlich, and Y. Riz, Stratospheric Response to Intraseasonal Changes in Incoming Solar Radiation, *Journal of Geophysical Research: Atmospheres*, 120, 7648-7660, doi: 10.1002/2015JD023244.
- Garfinkel, C.I., Waugh D. W., and L. M. Polvani (2015), Recent Hadley cell expansion: the role of internal atmospheric variability in reconciling modeled and observed trend, *Geophysical Research Letters*, 42, doi:10.1002/2015GL066942.
- Garfinkel, C. I., M. M. Hurwitz, and L. D. Oman, Effect of Recent Sea Surface Temperature Trends on the Arctic Stratospheric Vortex, *Journal of Geophysical Research: Atmospheres*, 120, 5404-5416, doi:10.1002/2015JD023284.
- Waugh D. W., C. I. Garfinkel, and L. M. Polvani, Drivers of the recent tropical expansion in the Southern Hemisphere: Changing SSTs or ozone depletion?, *Journal of Climate*, 28, 6581-6586, doi:10.1175/JCLI-D-15-0138.1.
- 2014** Garfinkel, C. I. and D. W. Waugh, Tropospheric Rossby Wave Breaking and Variability of the Latitude of the Eddy-driven Jets, *Journal of Climate*, doi: <http://dx.doi.org/110.1175/JCLI-D-14-00081>.
- Garfinkel, C. I., J. J. Benedict, and E. D. Maloney, *Geophysical Research Letters*, Impact of the MJO on the Boreal Winter Extratropical Circulation Vortex, doi:10.1029/2014GL061094.
- Hurwitz, M.M., N. Calvo, C. I. Garfinkel, A.H. Butler, S. Ineson, C. Cagnazzo, E. Manzini, and C. Pena-Ortiz (2014). Extra-tropical atmospheric response to ENSO in the CMIP5 models, *Clim. Dyn.*, DOI: 10.1007/s00382-014-2110-z.
- Aquila V., C. I. Garfinkel, P. A. Newman, L. D. Oman, D. W. Waugh, Modifications of the quasi-biennial oscillation by a geoengineering perturbation of the stratospheric aerosol layer. *Geophysical Research Letters*, 41(5), 1738-1744, DOI: 10.1002/2013GL058818.
- 2013** Garfinkel, C. I., Hurwitz, M. M., Oman, L. D., Waugh, D. W., Contrasting effects of central pacific and eastern pacific el nino on stratospheric water vapor. *Geophysical Research Letters*, 40, 4115-4120, doi: 10.1002/grl.50677
- Hurwitz, M.M., Garfinkel, C. I., P.A. Newman, and L.D. Oman, Sensitivity of the atmospheric response to Warm Pool El Nino events to modeled SSTs and future climate forcings. *J. Geophys. Res. Atmos*, 118(24), DOI: 10.1002/2013JD021051.
- Garfinkel, C. I., L. D. Oman, E. A. Barnes, D. W. Waugh, M. M. Hurwitz, A. M. Molod, Connections between the Spring Breakup of the Southern Hemisphere Polar Vortex, Stationary Waves, and Air-Sea Roughness, *J. Atmos. Sci.*, 70, 21372151, doi: <http://dx.doi.org/10.1175/JAS-D-12-0242.1>.

Garfinkel, C. I., Waugh, D. W., Oman, L. D., Wang, L., Hurwitz, M. M., Temperature trends in the tropical upper troposphere and lower stratosphere: Connections with sea surface temperatures and implications for water vapor and ozone. *J. Geophys. Res. Atmos*, 118(17), 9658-9672, doi: 10.1002/jgrd.50772. **Highlighted in a News and Views in Nature Climate Change**

Garfinkel, C. I., D. W. Waugh, E. P. Gerber, The Effect of Tropospheric Jet Latitude on Coupling between the Stratospheric Polar Vortex and the Troposphere, *Journal of Climate*., 26, 20772095, doi: <http://dx.doi.org/10.1175/JCLI-D-12-00301.1>.

Garfinkel, C. I., M. M. Hurwitz, D. W. Waugh, A.H. Butler, Are the Teleconnections of Central Pacific and Eastern Pacific El Nino Distinct in Boreal Wintertime?, *Climate Dynamics*, doi: 10.1007/s00382-012-1570-2.

**2012** Garfinkel, C. I., A.H. Butler, D. W. Waugh, M. M. Hurwitz, L. M. Polvani, Why might stratospheric sudden warmings occur with similar frequency in El Nino and La Nina winters?, *J. Geophys. Res. Atmos*, 117, D19106, doi:10.1029/2012JD017777.

Hurwitz, M.M., P.A. Newman, and Garfinkel C.I., On the Influence of North Pacific Sea Surface Temperatures on the Arctic Winter Climate, *J. Geophys. Res. Atmos*, 117, D19110, doi:10.1029/2012JD017819.

Garfinkel C. I., S. B. Feldstein, D. W. Waugh, C. Yoo, S. Lee, Observed Connection between Stratospheric Sudden Warmings and the Madden-Julian Oscillation, *Geophysical Research Letters*, 39, doi: 10.1029/2012GL053144.

Barnes, E. A. and Garfinkel, C.I., Barotropic eddy-jet coexistence and the response to surface friction: an alternative to the barotropic governor, *Journal of Atmospheric Sciences*, 69, doi: 10.1175/JAS-D-11-0243.1.

Garfinkel, C.I., T.A. Shaw, D.L. Hartmann, and D.W. Waugh, Does the Holton-Tan Mechanism Explain How the Quasi-Biennial Oscillation Modulates the Arctic Polar Vortex?, *Journal of Atmospheric Sciences*, 69, doi:10.1175/JAS-D-11-0209.1.

**2011** Garfinkel, C.I., A.M. Molod, L.D. Oman , I-S. Song, Improvement of the GEOS-5 AGCM upon updating the Air-Sea Roughness Parameterization, *Geophysical Research Letters*, 38, L18702, doi:10.1029/2011GL048802.

Hurwitz, M. M., Newman, P. A., and Garfinkel, C.I., The Arctic vortex in March 2011: a dynamical perspective, *Atmos. Chem. Phys.*, 11, 1144711453, doi:10.5194/acp-11-11447-2011.

Garfinkel, C.I. and D.L. Hartmann, The Influence of the Quasi-Biennial Oscillation on the Troposphere in Wintertime in a Hierarchy of Models, Part 2-Perpetual Winter WACCM runs, *Journal of Atmospheric Sciences*, 68, doi: 10.1175/2011JAS3702.1.

Garfinkel, C.I. and D.L. Hartmann, The Influence of the Quasi-Biennial Oscillation on the Troposphere in Wintertime in a Hierarchy of Models, Part 1-Simplified Dry GCMs, *Journal of Atmospheric Sciences*, 68, 1273-1289. doi: 10.1175/2011JAS3665.1.

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- 2010** Garfinkel, C.I. and D.L. Hartmann, The Influence of the Quasi-Biennial Oscillation on the North Pacific and El-Nino teleconnections, *J. Geophys. Res. Atmos.*, 115, D20116, doi:10.1029/2010JD014181.
- Garfinkel, C.I., D. L. Hartmann, and F. Sassi, Tropospheric Precursors of Anomalous Northern Hemisphere Stratospheric Polar Vortices, *Journal of Climate*, 23, doi: 10.1175/2010JCLI3010.1
- 2008** Garfinkel, C.I., and D.L. Hartmann, The Different ENSO Teleconnections and Their Effects on the Stratospheric Polar Vortex, *J. Geophys. Res. Atmos.*, 113, D18114, doi:10.1029/2008JD009920
- 2007** Garfinkel, C.I., and D.L. Hartmann, Effects of the El-Nino Southern Oscillation and the Quasi-Biennial Oscillation on polar temperatures in the stratosphere, *J. Geophys. Res. Atmos.*, 112, D19112, doi:10.1029/2007JD008481

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### Funded Grants

<b>2016- 2021</b>	European Research Council Starting Grant: Forecasting Surface Weather and Climate at One-Month Leads through Stratosphere-Troposphere Coupling	1,808,000 Euros
<b>2014- 2018</b>	Israeli Science Foundation: Influence of the Madden-Julian Oscillation and sea surface temperatures in the North Atlantic Ocean on winter climate over Europe and the Mediterranean	279,279 NIS/year

### Invited Conference Oral Presentations

<b>December 2014</b>	ARISE workshop
<b>December 2013</b>	American Geophysical Union Fall Meeting

### Other Oral Presentations

<b>March 2016</b>	Ewha Womans University, Seoul, South Korea, <i>invited</i>
<b>March 2016</b>	Seoul National University, Seoul, South Korea, <i>invited</i>
<b>February 2016</b>	SHARP Workshop, Berlin, Germany
<b>January 2016</b>	GFD days, Sde Boker, Israel
<b>October 2015</b>	Chemistry-Climate Modelling Initiative Workshop, Rome, Italy
<b>August 2015</b>	Workshop on Storm Tracks, Grindelwald, Switzerland
<b>April 2015</b>	European Geophysical Union General Assembly
<b>January 2015</b>	GFD days, Sde Boker, Israel
<b>December 2014</b>	Hebrew University
<b>December 2014</b>	University of Haifa, <i>invited</i>
<b>October 2014</b>	University of California, Los Angeles (UCLA)
<b>October 2014</b>	University of Washington
<b>May 2014</b>	Israeli Association for Aquatic Sciences Annual Meeting
<b>April 2014</b>	European Geophysical Union General Assembly
<b>February 2014</b>	Hebrew University
<b>December 2013</b>	Israel Meteorological Service, <i>invited</i>
<b>October 2013</b>	Hebrew University
<b>June 2013</b>	17th Conf. on the Middle Atmosphere
<b>June 2013</b>	19th Conference on Atmospheric and Oceanic Fluid Dynamics
<b>June 2013</b>	Goddard Space and Flight Center
<b>December 2012</b>	Hebrew University
<b>December 2012</b>	American Geophysical Union Fall Meeting
<b>November 2012</b>	Lamont Doherty Earth Observatory, <i>invited</i>
<b>October 2012</b>	Center for Ocean-Land-Atmosphere Studies, <i>invited</i>
<b>September 2012</b>	Massachusetts Institute of Technology, <i>invited</i>
<b>August 2012</b>	Cornell University
<b>August 2012</b>	Naval Research Laboratory
<b>July 2012</b>	McGill University, <i>invited</i>
<b>July 2012</b>	18th Conference on Air-Sea Interaction
<b>June 2012</b>	Ben Gurion University
<b>June 2012</b>	Hebrew University
<b>June 2012</b>	Tel Aviv University Geophysics Seminar
<b>June 2012</b>	Weizmann Institute
<b>May 2012</b>	Stony Brook University, <i>invited</i>
<b>April 2012</b>	University of Washington
<b>February 2012</b>	Workshop on Stratospheric Sudden Warming and its Role in Climate Variations
<b>February 2012</b>	Penn State University, <i>invited</i>
<b>November 2011</b>	University of California Irvine, <i>invited</i>

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November 2011 Georgia Institute of Technology, *invited*  
October 2011 University of Washington  
June 2011 18th Conference on Atmospheric and Oceanic Fluid Dynamics  
May 2011 CPC/NCEP, *invited*  
April 2011 Lamont Doherty Earth Observatory, *invited*  
February 2011 Princeton University/GFDL, *invited*  
January 2011 16th Conf. on the Middle Atmosphere,  
**Outstanding Student Paper Award**  
December 2010 Goddard Space and Flight Center  
November 2010 Columbia University, *invited*  
October 2010 University of Washington  
February 2010 Johns Hopkins University  
January 2010 NCAR  
November 2009 University of Washington Dynamics Seminar  
June 2009 University of Oxford, *invited*  
June 2009 University of Reading, *invited*  
June 2009 15th Conference on the Middle Atmosphere  
February 2009 University of Washington Dynamics Seminar  
January 2009 Ben Gurion University  
January 2009 Hebrew University Atmospheric Sciences Seminar  
January 2009 Tel Aviv University Geophysics Seminar  
January 2009 University of Reading Strathour  
June 2008 13th Annual CCSM Workshop, WACCM working group  
October 2007 University of Washington Dynamics Seminar  
August 2007 14th Conference on the Middle Atmosphere  
January 2007 University of Washington Dynamics Seminar

### Posters

October 2015 Chemistry-Climate Modelling Initiative Workshop, Rome, Italy  
April 2015 European Geophysical Union General Assembly  
April 2014 European Geophysical Union General Assembly  
January 2014 SPARC General Assembly, **Poster Award**  
December 2013 AGU Fall meeting  
December 2012 AGU Fall meeting  
February 2012 Workshop on Stratospheric Sudden Warming and its Role in Weather and Climate Variations  
October 2011 WCRP Open Science Conference  
June 2011 18th Conference on Atmospheric and Oceanic Fluid Dynamics  
January 2009 Workshop on Reducing the Uncertainty in the Prediction of Global Warming  
December 2008 AGU Fall meeting  
July 2008 Workshop on Stochastic and Probabilistic methods for atmosphere, ocean, and climate dynamics

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### Other Experience

Co-convener of the Storm Tracks Workshop, Grindelwald, Switzerland, August 2015

Co-convener of a session at the American Geophysical Union Fall Meeting, December 2012

Member of scientific steering group for SNAP, Stratospheric Network for the Assessment of Predictability

Reviewer for Nature Geosciences, Nature Climate Change, Nature Communications, Journal of Atmospheric Sciences, Journal of Climate, Climate Dynamics, Geophysical Research Letters, Quarterly Journal of the Royal Meteorological Society, Atmospheric Chemistry and Physics, Annales Geophysicae, Journal of the Meteorological Society of Japan, Environmental Research Letters, International Journal of Climatology, and Journal of Geophysical Research-Atmospheres

Reviewer for National Science Foundation (US), Pazi Foundation (Israel), NASA (US), Swiss National Science Foundation, and NERC (UK)

External Referee for two Ph.D. progress lectures (Yair Cohen, Yair Deleon)

Thesis Committee/Reviewer for two graduate students (Moshe Armon, Yair Deleon, Rony Lahav)

Served on faculty hiring committee, Department of Atmospheric Sciences, University of Washington, 2006-2007

Organized an atmospheric dynamics reading group, 2007-2008