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Present Position

Maurice Ewing and J. Lamar Worzel Professor of Geophysics in the Department of Applied Physics and Applied Mathematics, Professor of Earth & Environmental Sciences, and Senior Research Scientist at the Lamont Doherty-Earth Observatory, Columbia University.

Previous Positions

- Professor of Applied Mathematics, Columbia University, 2000-2020
- Associate Professor of Applied Mathematics, Columbia University, 1995-2000
- Assistant Professor of Applied Mathematics, Columbia University, 1990-1995
- Instructor in Applied Mathematics [non-tenure track], M.I.T., 1988-1990

Education

1988 Ph.D., MIT/WHOI Joint Program in Physical Oceanography
Thesis Title: *Geostrophic Vortex Dynamics*
Thesis Advisors: N.J. Zabusky and G.R. Flierl
1982 M.Sc., McGill University, Physics
1981 B.Sc., McGill University, with First Class Honours in Physics

Honors & Awards

2022 *Elected Fellow*, American Association for the Advancement of Science (AAAS)
2019 *Elected Fellow*, American Geophysical Union (AGU)
2016 *ATOC Distinguished Lecturer*, University of Colorado
2015 *Elected Fellow*, American Meteorological Society
2015 *Alliance Visiting Professor*, L'Ecole Polytechnique, Palaiseau (France)
2012 *Best Teacher of the Year*, Dept. of Earth and Environmental Sciences, Columbia
2008 *Great Teacher Award*, Society of Columbia Graduates
1997 *Distinguished Faculty Teaching Award*, Columbia SEAS Alumni Association
1994 NSF National *Young Investigator Award*
1987 *Fellow*, GTP Summer School on Geophysical and Astrophysical Turbulence, NCAR
1984 *Fellow*, Geophysical Fluid Dynamics Summer School, Woods Hole, MA
1983 *Jule G. Charney Award*, Massachusetts Institute of Technology
1981 Natural Science and Engineering Research Council of Canada Postgraduate Scholarship
1981 *Anne Molson Gold Medal* for Mathematics and Natural Philosophy, McGill University
1980-81 *J.W. McConnell Award*, McGill University
1979-81 *University Scholar*, McGill University

Professional Activities

- Co-author, Chapter 5, 2026 WMO Scientific Assessment of Ozone Depletion; and contributing author, Chapter 5, 2022 WMO Assessment; and review editor, Chapter 5, 2018 WMO Assessment; and co-author, Chapter 4, 2014 WMO Assessment; and co-author, Chapter 3, 2006 WMO Assessment
- University Corporation for Atmospheric Research (UCAR), Member Representative for Columbia University, 2003-present
- Member of the Committee on Polar Meteorology and Oceanography American Meteorological Society, 2019–2026
- Member of the Scientific Steering Committee of the Community Earth System Model (CESM) Project, 2014-2020
- Member of the International Commission on the Middle Atmosphere (ICMA), 2011-2019
- Co-Chair of the CESM Whole Atmosphere Working Group, 2010-2017
- Chair of the Committee on the Middle Atmosphere, American Meteorological Society, 2010–2012
- Chair of the Committee on Atmospheric and Oceanic Waves and Stability, American Meteorological Society, 1995–1998

Conference and Program Committees

- Member of the Organizing Committee, 16th Conference on Polar Meteorology and Oceanography, Madison, WI, August 2022
- Member of the Organizing Committee, 15th Conference on Polar Meteorology and Oceanography, Boulder, CO, May 2019
- Convener of the AGU Chapman Conference on "The Width of the Tropics", Santa Fe, NM, 2015
- Chair of the Organizing Committee, 18th Conference on the Middle Atmosphere, Newport, RI, 2013
- Member of the Organizing Committee, 16th Conference on the Middle Atmosphere, Seattle, WA, January 2011
- Chair of the "PlumbFest 2008" Symposium, Columbia University, New York, NY, October 2008
- Member of the Organizing Committee, 25th IUGG Conference on Mathematical Geophysics, New York, NY, June 2004
- Member of the Organizing Committee, 2002 Japanese-American Frontiers of Science Symposium, National Academy of Sciences, Irvine, CA, December 2002.
- Member of the Organizing Committee, Chapman Conference on the North Atlantic Oscillation, Lisbon, Portugal, December 2000
- Chair of the Organizing Committee, 12th Conference on Atmospheric and Oceanic Fluid Dynamics, Columbia University, June 1999

Visiting Positions and Appointments

- Affiliate Scientist, National Center for Atmospheric Research (CGD & ACD), 2004-2023
- Alliance Visiting Professor, L'École Polytechinque, Palaiseau, April-May 2015
- Visiting Scholar, Courant Institute for Mathematical Sciences, New York University, January to June 2006
- Visiting Scientist, NOAA/Geophysical Fluid Dynamics Laboratory, Princeton NJ, July 2001 to June 2002
- Visiting Scientist, Climate and Global Dynamics Division, NCAR, Summer 1994
- Staff Member, Geophysical Fluid Dynamics Summer School, Woods Hole, MA, Summer 1992

Courses taught, 1990 – 2024, at Columbia University

- APAM E1601 – *Introduction to Computational Physics and Mathematics*
- APMA E3101 – *Applied Mathematics I – Linear Algebra*
- APMA E3102 – *Applied Mathematics II – Differential Equations*
- APMA E4200 – *Partial Differential Equations*
- APMA E4204 – *Functions of a Complex Variable*
- APMA E6301 – *Analytical Methods for PDEs*
- APMA E6901 – *Special Topics in Applied Mathematics*
- APMA E8308 – *Asymptotic Methods in Applied Mathematics*
- APAM E9810 – *Mathematical Earth Science Seminar*
- APAM E4210 – *Geophysical Fluid Dynamics*
- APAM E9815 – *Geophysical Fluid Dynamics Seminar*
- EESC GU4008 – *Introduction to Atmospheric Science*
- EESC GR9910 – *Seminar in Atmospheric Science*

Undergraduate Research Students Advised

- Serge Voronin, 2005–2007: went on to graduate school at Princeton University
- Damian. Ancukiewicz, 2007–2008: went on to graduate school at UCSD
- Ana Lobo, 2014–2015: went on to graduate school at Caltech
- Sylvia Whang, 2024-present
- Benjamin Goodman, 2024-present

Graduate Students Advised

James Cho	Thesis title: Geophysical turbulence in shallow water with applications to planetary atmospheres. Graduation date: September 1996
Mark DiBattista	Thesis title: Vortex pairs in spherical geometry as models of atmospheric blocking. Graduation date: December 1996
Allen Kuo	Thesis title: Nonlinear geostrophic adjustment and wave-vortex interactions in rotating shallow water. Graduation date: May 1999
Leonard Rivier	Thesis title: Jet formation and equatorial superrotation in Jupiter's atmosphere: numerical modeling using a new efficient parallel code efficient parallel code. Graduation date: August 2001
Matthew Wittman	Thesis title: Stratospheric influences on baroclinic lifecycles. Graduation date: August 2006
Clara Orbe	Thesis title: Tracer-independent approaches to stratosphere-troposphere exchange and tropospheric air mass composition. Graduation date: April 2013
Neil Tandon	Thesis title: What is driving changes in the tropospheric circulation? New insights from simplified models. Graduation date: May 2013
Bernard Lipat	Thesis title: Quantifying and understanding the linkages between clouds and the general circulation of the atmosphere. Graduation date: May 2018.
Mark England	Thesis title: Understanding observed and projected climate changes in the Antarctic, and their global impacts. Graduation date: May 2019.
Jessie Oehrlein	Thesis title: Sudden stratospheric warmings and their impact on Northern hemisphere winter climate. Graduation date: April 2021.
Tyler Janoski	Thesis title: Exploring the timescales and mechanisms of polar amplification Graduation date: October 2023.
Ivan Mitevski	Thesis title: Asymmetric and non-monotonic response of the climate system to idealized CO_2 forcing. Graduation date: July 2023.
Paulina Czarnecki	Advised since Fall 2021; expected to graduate Summer 2025
Dana Raiter	Advised since Spring 2021; expected to graduate Summer 2027
You-Ting Wu	Advised since Spring 2021; expected to graduate Summer 2029

Post-doctoral Fellows Advised

Gavin Esler	1996–1998	now Professor at University College London
Richard Scott	2001–2003	now Professor at St. Andrews University
Andrew Charlton	2004–2006	now Professor at the University of Reading
Edwin Gerber	2006–2008	now Professor at New York University
Seok-woo Son	2006–2008	now Professor at Seoul National University
Sarah Kang	2009–2011	now Director of the Max Planck Institute in Hamburg
Shuguang Wang	2009–2012	now Professor at Nanjing University
Jimmy Booth	2010–2013	now Professor at the City University of New York
Harald Rieder	2011–2013	now Professor at BOKU University in Vienna, Austria
Elizabeth Barnes	2012–2013	now Professor at Colorado State University
Karen Smith	2011–2017	now Professor at the University of Toronto
Kevin Grise	2012–2014	now Professor at the University of Virgina
Abraham Solomon	2014–2016	now Mathematics Teacher at the YDE School in Brooklyn, NY
Gabriel Chiodo	2014–2018	now Ramon y Cajal Fellow, Instituto de Geociencias in Madrid
Aditi Sheshadri	2015–2017	now Professor at Stanford University
Katinka Bellomo	2015–2017	now Professor at the University of Padua
Antara Banerjee	2015–2018	now Senior Data Scientist with McKinsey & Co in Denver
Rei Chemke	2017–2020	now Professor at the Weizmann Institute, Israel
Kevin DallaSanta	2019–2000	now Quantitative Strategist at Virtu Financial in New York
Bithi De	2019–2022	now Research Scientist at Purdue University
Yu-Chiao Liang	2020–2021	now Professor at National Taiwan University
Yue Dong	2022–2023	now Professor at UCLA
Simon Lee	2021–2024	now Professor at St. Andrews University
Zachary McGraw	2021–	(current)
Sean Cohen	2024–	(current)

Academic Service

– Vice-chair, Department of Applied Physics and Applied Mathematics (2019-present)
– Faculty Advisor for the Applied Mathematics Graduate & Undergraduate Programs
– Faculty Advisor, TBΠ (Engineering Honor Society), Columbia Chapter, 2001-2012
– Faculty Advisor, Engineers Without Borders, Columbia Chapter, 2006-2009
– Faculty representative in the University Senate (2 rounds of three years)
– Innumerable other committees, surely not worth my listing or your reading…

Membership in Professional Societies

- American Meteorological Society
- American Physical Society
- European Geosciences Union
- American Geophysical Union
- American Astronomical Society
- Society for Industrial & Applied Mathematics

Conference attendance, with research presentations (since 2007, only)

- AGU General Assembly, San Francisco, CA (December 2007) [INVITED TALK]
- EGU General Assembly, Vienna, Austria (April 2008)
- SPARC 4th General Assembly, Bologna, Italy (September 2008)
- AGU General Assembly, San Francisco, CA (December 2008) [INVITED TALK]
- EGU Union General Assembly, Vienna, Austria (April 2009)
- AGU General Assembly, San Francisco, CA (December 2009)
- EGU General Assembly, Vienna, Austria (April 2010) [INVITED TALK]
- The International Polar Year Conference, Oslo, Norway (June 2010) [INVITED TALK]
- The 2nd SPARC DynVar Workshop, Boulder, CO (November 2010)
- AGU General Assembly, San Francisco, CA (December 2010) [INVITED TALK]
- 16th AMS Conference on the Middle Atmosphere, Seattle, WA (January 2011)
- 18th AMS Conference on Atmospheric and Oceanic Fluid Dynamics, Spokane, WA (June 2011)
- 16th Annual CESM Workshop, Breckenridge, CO (June 2011) [INVITED TALK]
- WCRP Open Science Conference, Denver CO (October 2011) [INVITED TALK]
- AGU General Assembly, San Francisco, CA (December 2011)
- EGU General Assembly, Vienna, Austria (April 2012)
- 17th Annual CESM Workshop, Breckenridge, CO (June 2012)
- Scientific Committee on Antarctic Research 5th Open Science Conference, Portland, OR (July 2012)
- Quadrennial Ozone Symposium, Toronto, Canada (August 2012)
- AGU General Assembly, San Francisco, CA (December 2012)
- The MIT Southern Ocean Workshop, Cambridge, MA (January 2013) [INVITED TALK]
- EGU General Assembly, Vienna, Austria (April 2013)
- The 3rd SPARC DynVar Workshop, Reading, UK (April 2013)
- 17th AMS Conference on the Middle Atmosphere, Newport, RI (June 2013)
- Davos Atmosphere and Cryosphere Assembly, Davos, CH (July 2013) [INVITED TALK]
- AGU General Assembly, San Francisco, CA (December 2013) [INVITED TALK]
- "Connecting the Tropics to Polar Regions" Conference, NY, NY (June 2014) [INVITED TALK]
- AGU General Assembly, San Francisco, CA (December 2014)
- 18th AMS Conference on the Middle Atmosphere, Phoenix, AZ (January 2015)
- Chapman Conference on "The Width of the Tropics", Santa Fe, NM (July 2015)
- AGU General Assembly, San Francisco, CA (December 2015)
- EGU General Assembly, Vienna, Austria (April 2016)
- 6th International HEPPA-SOLARIS Meeting, Helsinki (June, 2016)

- UW Friday Harbor Summer Workshop, Seattle, WA (September 2016) [INVITED TALK]
- WCRP Model Hierarchies Workshop, Princeton, NJ (November 2016)
- AGU General Assembly, San Francisco, CA (December 2016)
- EGU General Assembly, Vienna, Austria (April 2017) [INVITED TALK]
- AGCI Workshop on Polar Amplification, Aspen, CO (June 2017) [INVITED TALK]
- AGU General Assembly, New Orleans, CA (December 2017)
- EGU General Assembly, Vienna, Austria (April 2018) [INVITED TALK]
- SPARC 6th General Assembly, Kyoto, Japan (October 2018) [INVITED TALK]
- AGU General Assembly, Washington, DC (December 2018)
- 18th AMS Conference on the Middle Atmosphere, Phoenix, AZ (January 2019)
- EGU General Assembly, Vienna, Austria (April 2019)
- 15th AMS Conference on Polar Meteorology and Oceanography, Boulder, CO (May, 2019
- AGU General Assembly, San Francisco, CA (December 2019) [INVITED TALK]
- EGU General Assembly (virtual, May 2020)
- AGU General Assembly (virtual, December 2020)
- EGU General Assembly (virtual, April/May 2021)
- AGU General Assembly, New Orleans LA (hybrid, December 2021)
- EGU General Assembly (virtual, April/May 2021)
- AGU General Assembly, New Orleans LA (hybrid, December 2021)
- US CLIVAR Pattern Effect Workshop, Boulder, CO (May 2022)
- CFMIP Meeting On Clouds, Precipitation and Climate Sensitivity, Seattle WA (July 2022)
- 17th AMS Conference on Polar Meteorology and Oceanography, Madison, WI (August 2022)
- SPARC General Assembly, Boulder, CO (October 2022)
- AGU General Assembly, Chicago, IL (December 2022)
- 21st AMS Conference on Middle Atmosphere, Denver, CO (January, 2023)
- EGU General Assembly, Vienna, Austria (April 2023)
- 104th Annual Meeting of the AMS, Baltimore, MD (January 2024)
- US CLIVAR Workshop on Confronting Models with Observations, Boulder, CO (March 2024)
- EGU General Assembly, Vienna, Austria (April 2024)
- CFMIP Meeting on Clouds, Precipitation, Circulation and Clim. Sens., Boston, MA (June 2024)
- 22th AMS Conference on the Middle Atmosphere, Burlington, VT (June 2024)
- Quadrennial Ozone Symposium, Boulder, CO (July 2024) [INVITED TALK]
- AGU General Assembly, Washington, DC (December 2024)
- EGU General Assembly, Vienna, Austria (April 2025)
- 18th AMS Conference on Polar Meteorology and Oceanography, Denver, CO (May 2025)

1. Peer-reviewed journal articles:

2025

262. I. Mitevski, L.M. Polvani, H. He, G. Vecchi, C. Orbe, B. Soden, and R.L. Miller, 2025: **State dependence of CO_2 effective radiative forcing from 1/16× to 16×CO_2**, to appear in *npj Clim. Atmos. Sci.*

261. Michael Previdi and L.M. Polvani, 2025: **Effective heat capacity and its role in Arctic amplification**, to appear in *Geophys. Res. Lett.*

260. T. Janoski, I.Mitevski, R.J. Kramer, M. Previdi, and L.M. Polvani, 2025: **ClimKern: A new Python package and kernel repository for calculating radiative feedbacks**, *Geosci. Model Dev.* **18**, 3065-3079

259. I. Mitevski, S.H. Lee, G. Vecchi, C. Orbe and L.M. Polvani: **More Positive and Less Variable North Atlantic Oscillation at High CO2 forcing**, *npj Clim. Atmos. Sci.* **8**, 171

258. Y. Dong, L.M. Polvani, Y.-T. Hwang and M.R. England, 2025: **Stratospheric ozone depletion has contributed to the recent tropical La Niña-like cooling pattern**, *npj Clim. Atmos. Sci.* **8**, 150

257. N. Calvo, R.R. Garcia, G. Chiodo, D.R. Marsh and L. M. Polvani, 2025: **On the timescales of the response of the Brewer-Dobson circulation to an abrupt quadrupling of CO2**, *J. Geophys. Res.* **130**, e2024JD041780

256. Y.-C. Liang, O. Miyawaki, T. A. Shaw , I. Mitevski, L.M. Polvani and Y.-T. Hwang, 2025: **Linking Radiative-Advective Equilibrium Regime Transition to Arctic Amplification**, *Geophys. Res. Lett.* **52**, e2024GL113417

255. Z. McGraw, L.M. Polvani, Blaž Gasparini, E. Van de Koot and A. Voigt, 2025: **The Cloud Radiative Response to Surface Warming Weakens Hydrological Sensitivity**, *Geophys. Res. Lett.* **52**, e2024GL112368

2024

254. X. Zhang, D.W. Waugh, I. Mitevski, C. Orbe and L.M. Polvani, 2024: **Decreased Northern Hemisphere precipitation from consecutive CO2 doublings is associated with significant AMOC weakening**, *Environ. Res. Climate* **3**, 041005

253. E. Tejedor, L.M. Polvani, N.J. Steiger, M. Vuille and J.E. Smerdon, 2024: **No evidence of winter warming in Eurasia following large, low-latitude volcanic eruptions during the Last Millennium**, *J. Climate* **37**, 5653-5673

252. S. Lee and L.M. Polvani, 2024: **Large model biases in the Pacific centre of the Northern Annular Mode due to exaggerated variability of the Aleutian Low**, *Quart. J. Roy. Meteor. Soc. 150*, 4478-4497

251. I. Mitevski, R. Chemke, C. Orbe and L.M. Polvani, 2024: **Southern Hemisphere winter storm tracks respond differently to low and high CO_2 forcings**, *J. Climate* **37**, 5355-5372

250. Z. McGraw and L.M. Polvani, 2024: **How Volcanic Aerosols Globally Inhibit Precipitation**, *Geophys. Res. Lett.* **51**, e2023GL107930

249. Y.-T. Wu, Y.-C. Liang, M. Previdi, L.M. Polvani, M.R. England, M. Sigmond and M.-H. Luo, 2024: **Stronger Arctic Amplification from Anthropogenic Aerosols than from Greenhouse Gases**, *npj Clim. Atmos. Sci.* **7**, 142

248. Z. McGraw, K. DallaSanta, L.M. Polvani, K. Tsigaridis, C. Orbe and S.E. Bauer, 2024: **Severe global cooling after volcanic super-eruptions? The answer hinges on unknown aerosol size**,*J. Climate* **37**, 1449-1464

247. Y.-C. Liang, Y.-O. Kwon, C. Frankignoul, G. Gastineau, K.L. Smith, L.M. Polvani, L. Sun, Y. Peings, C. Deser, R. Zhang and J. Screen, 2024: **The weakening of the stratospheric polar vortex and the subsequent surface impacts as consequences to Arctic sea ice loss**, *J. Climate* **37**, 309-333

2023

246 Y. Dong, L.M. Polvani and D.B. Bonan, 2023: **Recent multi-decadal Southern Ocean surface cooling unlikely caused by Southern Annular Mode trends**, *Geophys. Res. Lett.* **50**, e2023GL106142

245 A. Peccia, Y. Moussallam, T. Plank, K. DallaSanta, L.M. Polvani, A. Burgisser, J. Larsen and J. Schaefer, 2023: **A new multi-method assessment of stratospheric sulfur load from the Okmok II caldera-forming eruption of 43 BCE**, *Geophys. Res. Lett.* **50**, e2023GL103334

244 S. Lee, M.K. Tippett and L.M. Polvani, 2023: **A new year-round weather regime classification for North America**,*J. Climate* **36**, 7091-7108

243 P. Czarnecki, L.M. Polvani and R. Pincus, 2023: **Sparse, Empirically optimized quadrature for broadband spectral integration**, *J. Advan. Model. Earth Syst.* **15**, e2023MS003819

242 D. Raiter, L.M. Polvani, I. Mitevski, A.G. Pendergrass and C. Orbe, 2023: **Little change in apparent hydrological sensitivity at large CO_2 forcing**, *Geophys. Res. Lett.* **50**, e2023GL104954

241 M. Bushuk, L.M. Polvani and M.R. England, 2023: **Comparing the impacts of ozone-depleting substances and carbon dioxide on Arctic sea ice loss**, *Environ. Res. Climate* **2**, 041001

240. Z. McGraw, T. Storelvmo, L.M. Polvani, S. Hofer, J. Shaw and A. Gettelman, 2023: **On the links between ice nucleation, cloud phase, and climate sensitivity in CESM2**, *Geophys. Res. Lett.*, **50**, e2023GL105053

239. S.-N. Zhou , Y.-C. Liang, I. Mitevski and L.M. Polvani, 2023: **Stronger Arctic amplification produced by decreasing, not increasing, CO_2 concentrations**, *Environ. Res. Climate* **2**, 045001

238. T. Janoski, M. Previdi, G. Chiodo, K.L. Smith and L.M. Polvani, 2023: **Ultrafast Arctic amplification and its governing mechanisms**, *Environ. Res. Climate* **2**, 035009

237. I. Mitevski, Y. Dong, L.M. Polvani, M. Rugenstein and C. Orbe, 2023: **Non-monotonic feedback dependence on CO_2 due to a North Atlantic pattern effect**, *Geophys. Res. Lett.* **50**, e2023GL103617

236. M.R. England and L.M. Polvani, 2023: **The Montreal Protocol is delaying the occurrence of the first ice-free Arctic summer**, *Proc. Nat. Acad. Sci.* **120**, e2211432120

235. L.M. Polvani, J. Keeble, A. Banerjee, R. Checa-Garcia, G. Chiodo, H. Rieder and K. Rosenlof, 2023: **No evidence of worsening Arctic springtime ozone losses over the 21st century**, *Nature Communications* **14**:1608

234. M. Sigmond, L.M. Polvani, J.C. Fyfe, C.J. Smith, J.N.S. Cole and M.R. England, 2023: **Large contribution of ozone-depleting substances to global and Arctic warming in the late 20th century**, *Geophys. Res. Lett.* **50**, e2022GL100563

233. H.A. Singh, N. Goldenson, J.C. Fyfe and L.M. Polvani, 2023: **Irreducible Southern Ocean state uncertainty due to global ocean initial conditions**, *J. Climate* **35**, 383–403

232. Y.-T. Wu, Y.-C. Liang, Y.-N. Kuo, F. Lehner, M. Previdi, L.M. Polvani, M.-H. Lo and C.-W. Lan, 2023: **Exploiting SMILEs to understand Arctic climate change seasonality and Uncertainty**, *Geophys. Res. Lett.* **50**, e2022GL100745

2022

231. A. Fiore and 9 co-authors (including L.M. Polvani), 2022: **Understanding recent tropospheric ozone trends in the context of large internal variability: A new perspective from chemistry-climate model ensembles**, *Environ. Res. ClimateJ. Climate* 1, 025008

230. S. Lee, L.M. Polvani and B. Guan, 2022: **Modulation of Atmospheric Rivers by the Arctic Stratospheric Polar Vortex**, *Geophys. Res. Lett.* **49**, e2022GL100381

229 K. DallaSanta and L.M. Polvani, 2022: **Volcanic stratospheric injections up to 160 Tg(S) yield a Eurasian winter warming indistinguishable from internal variability**, *Atmos. Chem. Phys.* **22**, 8842–8862

228. G. Chiodo and L.M. Polvani, 2022: **New insights on the radiative impacts of ozone-depleting substances**, *Geophys. Res. Lett.* **49**, e2021GL096783

227. R. Chemke, L. Zanna, C. Orbe, L. Sentman and L.M. Polvani, 2022: **The future intensification of the North Atlantic winter storm track: the key role of dynamic ocean coupling**, *J. Climate* **35**, 2407–2421

226. S. Hay, P.J. Kushner, R. Blackport, K.E. McCusker, T. Oudar, L. Sun, M. England, C. Deser, J.A. Screen and L.M. Polvani, 2022: **Separating the influences of low-latitude warming and sea-ice loss on Northern Hemisphere climate change**, *J. Climate* **35**, 2327–2349

225. I. Mitevski, L.M. Polvani and C. Orbe, 2022: **Asymmetric warming/cooling response to CO_2 increase/decrease due to non-logarithmic forcing, not feedbacks**, *Geophys. Res. Lett.* **23**, e2021GL097133

224. A. Scaife and 19 co-authors (including L.M. Polvani), 2022: **Long Range Prediction and the Stratosphere**, *Atoms. Chem. Phys.* **22**, 2601–2623

223. Y-C. Liang, L.M. Polvani and I. Mitevski, 2022: **Arctic amplification, and its seasonal migration, over a wide range of abrupt CO_2 forcing**, *npj Clim. Atmos. Sci.* **5**, 14

222. Y-C. Liang, L.M. Polvani, M. Previdi, K.L. Smith, M.R. England and G. Chiodo, 2022: **Stronger Arctic Amplification from Ozone-Depleting Substances than from Carbon Dioxide**, *Environ. Res. Lett.* **17**:024010

2021

221. J. Oehrlein, L.M. Polvani, L. Sun and C. Deser, 2021: **How well do we know the surface impact of sudden stratospheric warmings?** *Geophys. Res. Lett.* **48**, 22, e2021GL095493

220. B. De, G. Tselioudis and L.M. Polvani, 2021: **Improved representation of atmospheric dynamics in CMIP6 models removes climate sensitivity dependence on Hadley Cell climatological extent**, *Atmos. Sci. Lett.* **22**:e1073

219. L.M. Polvani, A. Banerjee, R. Chemke, E.W. Doddridge, D.Ferreira, A. Gnanadesikan, M.A. Holland, Y. Kostov, J. Marshall, W.J.M. Seviour, S. Solomon, and D.W. Waugh, 2021: **Interannual SAM modulation of Antarctic sea ice extent does not account for its long-term trends, pointing to a limited role for ozone depletion**, *Geophys. Res. Lett.* **48**, 21, e2021GL094871

218. M. Previdi, K.L. Smith and L.M. Polvani, 2021: **Arctic amplification of climate change: A review of underlying mechanisms**, *Environ. Res. Lett.* **16**:093003

217. R. Chemke, L.M. Polvani, J. Kay and C. Orbe, 2021: **Quantifying the role of ocean coupling in Arctic amplification and sea-ice loss over the 21st century**, *npj Clim. Atmos. Sci.* **4**, 46

216. K.L. Smith and L.M. Polvani, 2021: **Modeling evidence for a large, ENSO-driven, interannual, wintertime AMOC variability**, *Environ. Res. Lett.* **16**:084038

215. P. Pisoft, P. Sacha, L.M. Polvani, and 11 co-authors, 2021: **Stratospheric contraction caused by increasing greenhouse gases**, *Environ. Res. Lett.* **16**:064038

214. A. Banerjee, A.H. Butler, L.M. Polvani, A. Robock, I.R. Simpson and L. Sun, 2021: **Robust winter warming over Eurasia under stratospheric sulfate geoengineering - the role of stratospheric dynamics 21**, 6985-6997

213. I. Mitevski, C. Orbe, R. Chemke, L. Nazarenko and L.M. Polvani, 2021: **Non-monotonic response of the climate system to abrupt CO_2 forcing**, *Geophys. Res. Lett.* **48**, e2020GL090861

212. R. Chemke and L.M. Polvani, 2021: **Elucidating the mechanisms responsible for Hadley cell weakening under $4\times CO_2$ forcing**, *Geophys. Res. Lett.* **48**, e2020GL090348

2020

211. R. Chemke, M. Previdi, M.R. England and L.M. Polvani, 2020: **Distinguishing the impacts of ozone and ozone depleting substances on the recent increase in Antarctic surface mass balance**, *The Cryosphere* **14**, 4135-4144

210. L.M. Polvani and S.J. Camargo, 2020: **Scant evidence for a volcanically forced winter warming over Eurasia following the Krakatau eruption of August 1883**, *Atmos. Chem. Phys.* **20**, 13687–13700

209. D.M. Mitchell, Y.T. Lo, W.J.M. Seviour, L. Haimberger and L.M. Polvani, 2020: **The vertical profile of recent tropical temperature trends: Persistent model biases in the context of internal variability**, *Environ. Sci. Lett.*, **15**:1040b4

208. H.A. Singh and L.M. Polvani, 2020: **Low Antarctic climate sensitivity due to high ice sheet orography**, *npj Climate and Atmospheric Science*, **3**, 39

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