Rei Chemke

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Education

2014-2017 PhD Atmospheric Dynamics, Weizmann Institute of Science, Advisor: Yohai Kaspi
2012-2014 MSc Atmospheric Dynamics, Weizmann Institute of Science, Advisor: Yohai Kaspi
2009-2012 BSc Atmosphere, Ocean and Climate Sciences, Hebrew University

Professional Positions

2020-present Assistant Professor, Weizmann Institute of Science
2019-2020 Postdoctoral research scientist, Columbia University
2017-2019 Postdoctoral fellow, Columbia University

Fellowships and Awards

2022 Princeton AOS-GFDL Visitors Research Scholar Fellowship
2017 The NOAA Climate and Global Change Postdoctoral Fellowship
2017 The Prof. Israel Dostrovsky Prize of Excellence, Weizmann Institute of Science
2016 The Rieger Foundation Fellowship
2015 The Lev-Zion Scholarship for Excellent Ph.D students
2015 The Rieger Foundation Fellowship
2014 The Dean's Prize for M.Sc Students, Weizmann Institute of Science
2010 The Dean's Prize for B.Sc Students, Hebrew University

Teaching Experience

2014, 2017 Teaching assistant Introduction to Earth climate system, Weizmann Institute of Science
2014-2017 Instructor Middle school mathematics, Lod Ort school for science

Institutional Responsibilities

2021-present Organizer Earth & Planetary Sciences Dept. seminar, Weizmann Institute of Science
2022 Organizer Symposium on Geophysical Fluid Dynamics (GFD days) VII, Sde Boker, Israel
2018-2019 Organizer Climate Science Colloquium, Dept. of Applied Physics and Applied Mathematics Columbia University

Reviewing Activities

2016-present Reviewer for: National Science Foundation, Science Advances, Nature Climate Change, Nature communications, npj Climate Atmos. Sci., Geophysical Research Letters, Journal of Atmospheric Sciences, Journal of Climate, Journal of Physical Oceanography, Fluids, Astrophysical Journal

Supervision of graduate students

Current

2023-present Itamar Karbi (PhD), Dept. of Earth & Planetary Sciences, Weizmann Institute of Science
2022-present Or Hess (MSc), Dept. of Earth & Planetary Sciences, Weizmann Institute of Science
2022-present Noga Liberty (MSc), Dept. of Earth & Planetary Sciences, Weizmann Institute of Science

Graduated

2021-2022 Itamar Karbi (MSc), Dept. of Earth & Planetary Sciences, Weizmann Institute of Science

Publications

31. **Chemke, R.** Y. Ming and J. Yuval, 2022. The intensification of winter mid-latitude storm tracks in the Southern Hemisphere, Nature Climate Change,12, 553-557. url
30. **Chemke, R.**, 2022. The future poleward shift of Southern Hemisphere summer mid-latitude storm tracks stems from ocean coupling , Nature Communications, 13, 1730. url

29. **Chemke, R.**, L. Zanna, L. M. Polvani, C. Orbe and L. Sentman, 2022. The Future Intensification of the North Atlantic Winter Storm Track: The Key Role of Dynamic Ocean Coupling, J. Clim., 35, 8, p. 2407-2421. url
28. **Chemke, R.**, 2022. Large hemispheric differences in the Hadley cell variability due to ocean coupling, npj Climate Atmos. Sci., 5, 1. url
27. Polvani, L. M., A. Banerjee, **R. Chemke** E. W. Doddridge, D. Ferreira, A. Gnanadesikan, M. A. Holland, Y. Kostov, J. Marshall, W. J. M. Seviour, S. Solomon, 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, e2021GL094871. url
26. **Chemke, R.**, L. M. Polvani, J. E. Kay and C. Orbe, 2021. Quantifying the role of ocean coupling in Arctic amplification and sea-ice loss over the 21st century, npj Climate Atmos. Sci., 4, 46. url
25. Mitevski, I., C. Orbe, **R. Chemke**, L. Nazarenko and L. M. Polvani, 2021. Non-monotonic response of the climate system to abrupt CO2 forcing, Geophys. Res. Lett., 48, 6, e2020GL090. url
24. **Chemke, R.** and L. M. Polvani, 2021. Elucidating the mechanisms responsible for Hadley cell weakening under 4xCO2 forcing, Geophys. Res. Lett., 48, 3, 2020GL0903. url
23. **Chemke, R.**, 2021. Future Changes in the Hadley Circulation: The Role of Ocean Heat Transport, Geophys. Res. Lett., 48, 4, e2020GL091. url
22. **Chemke, R.** and Y. Ming, 2020. Large atmospheric waves will get stronger while small waves will get weaker, Geophys. Res. Lett., 47, 22, e2020GL090. url
21. **Chemke, R.**, 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, 11, p. 4135-4144. url
20. **Chemke, R.** and L. M. Polvani, 2020. Using multiple large ensembles to elucidate the discrepancy between the 1979–2019 modeled and observed Antarctic sea ice trends, Geophys. Res. Lett., 47, e2020GL0-88339. url
19. **Chemke, R.**, L. Zanna and L. M. Polvani, 2020. Identifying a human signal in the North Atlantic warming hole, Nature Communication, 11, 1540. url
18. **Chemke, R.** and L. M. Polvani, 2020. Linking midlatitudes eddy heat flux trends and polar amplification, npj Climate Atmos. Sci., 3, 8. url
17. **Chemke, R.** and L. M. Polvani, 2019. Opposite tropical circulation trends in climate models and in reanalyses, Nature Geoscience, 12, 528-532. url
16. **Chemke, R.** and L. M. Polvani, 2019. Exploiting the abrupt 4xCO2 scenario to elucidate tropical expansion mechanisms, J. Clim., 32, 859-875. url
15. Galperin, B., S. Sukoriansky, R. M. B. Young, **R. Chemke**, Y. Kaspi, P. L. Read N. Dikovskaya, 2019. Barotropic and zonostrophic turbulence, review chapter in: zonal jets, Cambridge University Press, Chap. 13. url
14. **Chemke, R.**, L. M. Polvani and C. Deser, 2019. The effect of Arctic sea-ice loss on the Hadley circulation, Geophys. Res. Lett., 46, 963–972. url
13. **Chemke, R.** and L. M. Polvani, 2018. Ocean circulation reduces the Hadley cell response to increased greenhouse gases, Geophys. Res. Lett., 45, 9197–9205. url
12. **Chemke, R.** and G. Dagan, 2018. The effects of the spatial distribution of anthropogenic aerosols radiative forcing on atmospheric circulation, J. Clim., 31, 7129-7145. url
11. **Chemke, R.** and Y. Kaspi, 2017. Dynamics of massive atmospheres, Astrophys. J., 845, 1. url
10. **Chemke, R.** 2017. Atmospheric energy transfer response to global warming, Quart. J. Roy. Meteor. Soc., 143, 2296–2308. url
9. **Chemke, R.**, Y. Kaspi and I. Halevy, 2016. The thermodynamic effect of atmospheric mass on early Earth's temperature, Geophys. Res. Lett., 43, 11,414–11,422. url
8. Dagan, G. and **R. Chemke**, 2016. The effect of subtropical aerosol loading on equatorial precipitation, Geophys. Res. Lett., 43, 11,048–11,056. url
7. **Chemke, R.**, T. Dror and Y. Kaspi, 2016. Barotropic kinetic energy and enstrophy transfers in the atmosphere, Geophys. Res. Lett., 43, 7725-7734. url

6. **Chemke, R.** and Y. Kaspi, 2016. The effect of eddy-eddy interactions on jet formation and macroturbulent scales, J. Atmos. Sci., 73 (5), 2049-2059. url
5. **Chemke, R.** and Y. Kaspi, 2016. The latitudinal dependence of the oceanic barotropic eddy kinetic energy and macroturbulence energy transport, Geophys. Res. Lett., 43, 2723-2731. url
4. **Chemke, R.** and Y. Kaspi, 2015. The Latitudinal Dependence of Atmospheric Jet Scales and Macroturbulent Energy Cascades. J. Atmos. Sci., 72 (10), 3891–3907. url
3. **Chemke, R.** and Y. Kaspi, 2015. Poleward migration of eddy-driven jets, J. Adv. Model. Earth Syst., 07, 1457-1471. url
2. Rosenfeld, D., **R. Chemke**, K. Prather, K. Suski, J.M. Comstock, B. Schmid, J. Tomlinson and H. Jonsson, 2014. Polluting of winter convective clouds upon transition from ocean inland over central California: Contrasting case studies. Atmos. Res., 135, 112-127. url
1. Rosenfeld, D., **R. Chemke**, P. DeMott, R.C. Sullivan, R. Rasmussen, F. McDonough, J.M. Comstock, B. Schmid, J. Tomlinson, H. Jonsson, K. Suski, A. Cazorla and K. Prather, 2013. The common occurrence of highly supercooled drizzle and rain near the coastal regions of the western United States, J. Geophys. Res., 118(17), 9819-9833. url

Presentations at conferences and seminars

Conferences

- The American Geoscience Union General Assembly, 2022.
- 23rd American Meteorological Society Conference on Atmospheric and Oceanic Fluid Dynamics, Breckenridge, CO, USA, 2022.
- The storm tracks workshop, Oleron, France, 2022.
- The European Geoscience Union General Assembly, 2022.
- The American Geoscience Union General Assembly, 2021.
- The American Geoscience Union General Assembly, 2020.
- The American Geoscience Union General Assembly, San Francisco, USA, 2019.
- The American Geoscience Union General Assembly, Washington D.C., USA, 2018.
- 21th American Meteorological Society Conference on Atmospheric and Oceanic Fluid Dynamics, Portland, OR, USA, 2017.
- Symposium on Physical Aspects of Global and Regional Climate Dynamics, Sde Boker, Israel, 2017.
- Symposium on Physical Aspects of Global and Regional Climate Dynamics, Sde Boker, Israel, 2016.
- SPARC storm tracks workshop, Grindelwald, Switzerland, 2015.
- 20th American Meteorological Society Conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, MN, USA, 2015.
- The European Geoscience Union General Assembly, Vienna, Austria, 2015.
- Theoretical Advances in Planetary Flows and Climate Dynamics, Les Houches, France, 2015.
- Symposium on Physical Aspects of Global and Regional Climate Dynamics, Sde Boker, Israel, 2015.
- Atmospheric and climate dynamics: from clouds to global circulations, Zurich, Switzerland, 2014.
- The European Geoscience Union General Assembly, Vienna, Austria, 2014.
- Symposium on Physical Aspects of Global and Regional Climate Dynamics, Sde Boker, Israel, 2014.

Seminars

- Physical Oceanography seminar, Woods Hole Oceanographic Institution, USA, April 2022.
- CAOSeminar, The Earth Science Institute, Hebrew University, Israel, November 2021.
- Department of Geophysics, Tel Aviv University, Israel, November 2021.
- ClimaTea seminar, Harvard, USA, April 2019.
- Ocean and Climate Physics seminar, Columbia University, USA, February 2019.
- Geophysical and Astrophysical Fluid Dynamics seminar, Exeter University, UK, November 2018.
- Earth and planetary sciences seminar, Weizmann Institute of Science, Israel, November 2018.

- The joint seminar of Hamburg University and Max Planck Institute for Meteorology, Max Planck Institute for Meteorology, Germany, November 2018.
- Atmospheric, Oceanic and Planetary Physics seminar, Oxford University, UK, November 2018.
- Department of Meteorology and Atmospheric Science, Penn State University, USA, October 2018.
- Geophysical fluid dynamics laboratory, USA, October 2018.
- Center for Environmental and Applied Fluid Mechanics seminar Johns Hopkins University, USA, September 2018.
- Department of atmospheric science seminar, Colorado State University, USA, September 2018.
- Climate and Global Dynamics seminar, NCAR, USA, August 2018.
- Program in atmospheres, oceans and climate seminar, MIT, USA, March 2018.
- Geophysical Sciences department seminar, U. Chicago, USA, February 2018.
- Atmosphere Ocean Science Colloquium, NYU, USA, February 2018.
- Earth and planetary sciences seminar, Weizmann Institute of Science, Israel, may 2017.
- Atmospheric sciences seminar, The Earth Science Institute, Hebrew University, Israel, April 2017.
- The joint seminar of Hamburg University and Max Planck Institute for Meteorology, Max Planck Institute for Meteorology, Germany, April 2017.
- Atmospheric sciences seminar, The Earth Science Institute, Hebrew University, Israel, January 2015.
- Earth and planetary sciences seminar, Weizmann Institute of Science, Israel, November 2014.