Malte F. Jansen

Department of the Geophysical Sciences
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Education

Massachusetts Institute of Technology (MIT) — Cambridge, MA, USA
PhD in Climate Physics and Chemistry — February 2013
Thesis title: "Equilibration of an Atmosphere by Geostrophic Turbulence"
Advisor: Raffaele Ferrari

IFM-GEOMAR / University Kiel — Kiel, Germany
Diplom (≈M.Sc.), with distinction, in Meteorology — June 2007
Thesis title: "Simple Conceptual models for Tropical Ocean-Atmosphere Interactions on Interannual Timescales". Advisor: Dietmar Dommenget

University of Heidelberg — Heidelberg, Germany
Vordiplom (≲B.S.) in Physics — October 2003

Employment

Department of the Geophysical Sciences, The University of Chicago — Chicago, IL
Assistant Professor — Jan 2015 - present

Geophysical Fluid Dynamics Laboratory / Princeton University — Princeton, NJ, USA
NOAA Climate and Global Change Postdoctoral Fellow — Jul. 2013 – Dec. 2014
AOS Postdoctoral Research Associate — Apr. 2013 – Jun 2013

Department of Earth, Atmospheric and Planetary Sciences, MIT — Cambridge, MA, USA
Postdoctoral Associate — Nov. 2012 – Mar 2013

Selected Awards and Fellowships

National Science Foundation CAREER award	2019-2024
Nicholas P. Fofonoff Award from the American Meteorological Society, in recognition of research achievement in the field of physical oceanography	Jan. 2019
NOAA Climate and Global Change Postdoctoral Fellowship	2013 - 2014
Carl-Gustaf Rossby Award for the best PhD thesis completed in the preceding year in the Program in Atmospheres, Oceans and Climate, MIT	May 2013
GFD Fellow at Woods Hole Oceanographic Institution	Summer 2008
Shrock Fellowship in MIT's Department of Earth, Atmospheric, and Planetary Sciences	2007-2008
Fellow of the German National Academic Foundation	2004-2007

Teaching

Introduction to Research in the Geophysical Sciences, University of Chicago	Fall 2017/18
Turbulence and Transport Processes in the Atmosphere and Oceans, University of Chicago	Fall 2016 / Spring 2018
Large-Scale Ocean Dynamics, University of Chicago	Winter 2016 / Spring 2017/19
Lecturer at „Rossbypalooza“ Summer School, University of Chicago	Summer 2016/18

Advising

PhD students:

Hailu Kong, University of Chicago	2015- present
Tatsu Monkman, University of Chicago	2018-present

Undergraduate students:

Francisco Spaulding, University of Chicago	2016-2017
Kendall Mehling, University of Chicago	2018-present
David Vishny, University of Chicago (Honors 2019, co-advised with D. Archer)	2018-present

Summer students:

Ashley Payne, Woods Hole GFD program	Summer 2014
Lei Wang (co-advised with Ryan Abernathey), Woods Hole Oceanogr. Inst.	Summer 2014
Yaoxuan Zeng, University of Chicago (guest student from Peking University)	Summer 2019

Postdoctoral scholars:

Sina Khani, University of Chicago (co-advised with Alistair Adcroft at Princeton)	2016-2019
Alice Marzocchi, University of Chicago (Now Research Scientist at the National Oceanography Center, Southampton)	2016-2018

Service

Member of the AMS' committee on Atmospheric and Oceanic Fluid Dynamics, 2017-present

Member of US CLIVAR Paleo AMOC Task Team, 2018-present

Reviewer and Panelist for the *National Science Foundation,* and reviewer for *Climate Dynamics*, *Geophys. Res. Lett., JAMES, J. Climate, J. Fluid Mech., J. Geophys. Res.*, *J. Phys. Oceanogr., Nature Geoscience*, *Nature Communications*, *Ocean Modelling*, *Ocean Science, Paleoceanography, Physics of Fluids,* and *Science*

Session Chair, 19th, 20th, 21st and 22nd Conference on Atmospheric and Oceanic Fluid Dynamics, 2013, 2015, 2017, 2019, and Ocean Sciences Meeting 2016

Publications

In review and in revision:

Khani, S., M.F. Jansen and A. Adcroft: Diagnosing subgrid mesoscale eddy fluxes with and without topography. In revision for publication in *JAMES.*

Checlair, J.H., S.L. Olson, M.F. Jansen M.F. and D.S. Abbot: No snowball on habitable tidally locked planets with a dynamic ocean, In revision for publication in *Astrophysical Journal.*

Cael, B. B. and M.F. Jansen: On freshwater fluxes and the Atlantic meridional overturning circulation. In revision for publication in *Limnology and Oceanography Letters.*

Adcroft, A., W. Anderson, C. Blanton, M. Bushuk, C. O. Dufour, J. P. Dunne, S. M. Griffies, R. W. Hallberg, M. J. Harrison, I. Held, M. F. Jansen, J. John, J. P. Krasting, A. Langenhorst, S. Legg, Z. Liang, C. McHugh, A. Radhakrishnan, B. G. Reichl, T. Rosati, B. L. Samuels, A. Shao, R. Stouffer, M. Winton, A. T. Wittenberg, B. Xiang, N. Zadeh, and R. Zhang (2019), The GFDL global ocean and sea ice model OM4.0: Model description and simulation features, in review for *JAMES*.

Marzocchi, A. and M.F. Jansen: A direct link between surface cooling and increased glacial carbon storage through changes in Antarctic sea ice. Accepted pending minor revisions in *Nature Geosci.*

Published:

Komacek, T. D., Jansen, M. F., Wolf, E. T., & Abbot, D. S. 2019: Scaling Relations for Terrestrial Exoplanet Atmospheres from Baroclinic Criticality. *Astrophysical Journal,* in press (preprint at arXiv:1908.02661).

Jansen, M.F., Adcroft, A., Khani, S. and Kong, H. 2019: Towards an energetically consistent, resolution aware parameterization of ocean mesoscale eddies. *JAMES*, https://doi.org/10.1029/2019MS001750.

Nadeau, L.P., R. Ferrari and M.F. Jansen 2019: Antarctic sea ice control on the depth of North Atlantic Deep Water. *J. Climate,* 32, 2537–2551.

Jansen, M.F. and L.-P. Nadeau 2019: A toy model for the response of the residual overturning circulation to surface warming. *J. Phys. Oceanogr*, 49, 1249–1268.

Klöwer, M., M.F. Jansen, M. Claus, R.J. Greatbatch, and S. Thomsen 2018: Energy budget-based backscatter in a shallow water model of a double gyre basin. *Ocean Modelling*, 132, 1-11.

Jansen, M.F., L-P Nadeau, T.M. Merlis 2018: Transient vs. equilibrium response of the ocean's overturning circulation to warming. *J. Climate*, 31, 5147–5163.

Hoffman P.F ., D. S. Abbot, Y. Ashkenazy, D. I. Benn , J. J. Brocks, P. A. Cohen, G. M. Cox, J. R. Creveling, Y. Donnadieu, D. H. Erwin, I. J. Fairchild, D. Ferreira, J. C. Goodman, G. P. Halverson, M. F. Jansen, G. Le Hir, G. D. Love, F. A. Macdonald1, A. C. Maloof, C. A. Partin, G. Ramstein, B. E. J. Rose, C. V. Rose, Peter M. Sadler, E. Tziperman, A. Voigt and S. G. Warren, 2017: Snowball Earth climate dynamics and Cryogenian geology–geobiology. *J. Science Advances*, 3, 11.

Kong, H. and M.F. Jansen, 2017: The eddy diffusivity in barotropic β-plane turbulence. *Fluids*, special issue on *Geophysical Fluid Dynamics* 2,54.

Marzocchi, A. and Jansen, M.F., 2017. Connecting Antarctic sea ice to deep‐ocean circulation in modern and glacial climate simulations. *Geophys. Res. Lett.*, *44*(12), 6286-6295.

Yang J., M. F. Jansen, F. A. Macdonald, and D. S. Abbot, 2017: Persistence of a freshwater surface ocean after a snowball Earth, *Geology* 45 (7), 615-618.

Jansen, M.F., 2017. A note on: "A Gaussian-product stochastic Gent–McWilliams parameterization". *Ocean Modelling,* 110, 49-51.

Jansen, M.F., 2017. Glacial ocean circulation and stratification explained by reduced atmospheric temperature. *Proc. Natl. Acad. Sci.*, *114*(1), 45-50.

Jansen, M.F. and L-P. Nadeau, 2016: The effect of Southern Ocean surface buoyancy loss on the deep-ocean circulation and stratification. *J. Phys. Oceanogr.*, 46, 3455–3470.

Chai, J., M. Jansen, and G. Vallis, 2016: Equilibration of a baroclinic planetary atmosphere toward the limit of vanishing bottom friction. *J. Atmos. Sci.*, 73, 3249–3272.

Jansen, M. F., 2016: The turbulent circulation of a Snowball Earth ocean. *J. Phys. Oceanogr.*, *46*(6), 1917-1933.

Wang, L., M. Jansen, and R. Abernathey, 2016: Eddy Phase Speeds in a two-layer model of quasigeostrophic baroclinic turbulence with applications to ocean observations. *J. Phys. Oceanogr.*, 46, 1963–1985.

Cronin, T. W. and M. F. Jansen, 2016: Analytic radiative-advective equilibrium as a model for high-latitude climate. *Geophys. Res. Lett.,* 43, 449–457

Payne, A. E., M. F. Jansen, and T. W. Cronin, 2015: Conceptual model analysis of the influence of temperature feedbacks on polar amplification, *Geophys. Res. Lett.*, 42, 9561–9570

Jansen, M.F., I.M. Held, A.J. Adcroft, and R. Hallberg, 2015: Energy budget-based backscatter in an eddy permitting primitive equation model. *Ocean Modelling*, 94, 15-26.

Zurita‐Gotor, P., I.M Held, and M. F. Jansen, 2015: Kinetic energy‐conserving hyperdiffusion can improve low resolution atmospheric models. *Journal of Advances in Modeling Earth Systems*, doi: 10.1002/2015MS000480

Jansen, M.F., A.J. Adcroft, R. Hallberg, and I.M. Held, 2015: Parameterization of eddy fluxes based on a mesoscale energy budget. *Ocean Modelling,* 92, 28-41

Burke, A., Stewart, A.L., Adkins, J.F., Ferrari, R., Jansen, M.F. and Thompson, A.F., 2015. The glacial mid‐depth radiocarbon bulge and its implications for the overturning circulation. *Paleoceanography*, *30*(7), pp.1021-1039.

Jansen, M. and Ferrari, R., 2015. Diagnosing the vertical structure of the eddy diffusivity in real and idealized atmospheres. *Quarterly Journal of the Royal Meteorological Society*, *141*(687), pp.631-641.

Jansen, M.F. and I.M. Held, 2014: Parameterizing subgrid-scale eddy effects using energetically consistent backscatter. *Ocean Modeling*, 80, 36-48

Ferrari, R., M. Jansen, J. Adkins, A. Burke, A.L. Stewart, and A. Thompson, 2014: Antarctic sea ice control on ocean circulation in present and glacial climates. *Proc. Natl. Acad. Sci.*, 111 (24) 8753-8758.

Jansen, M. and R. Ferrari, 2013: Equilibration of an atmosphere by adiabatic eddy fluxes. *J. Atmos. Sci.*, 70, 2948–2962

Jansen, M. and R. Ferrari, 2013: The vertical structure of the eddy diffusivity and the equilibration of the extra-tropical atmosphere. *J. Atmos. Sci.,* 70, 1456–1469

Jansen, M. and R. Ferrari, 2012: Macroturbulent equilibration in a thermally forced primitive equation system. *J. Atmos. Sci.*, 69, 695-713

Jansen, M. F., R. Ferrari and T.A., Mooring, 2010: Seasonal versus permanent thermocline warming by tropical cyclones. *Geophys. Res. Lett.*, 37, L03602, doi:10.1029/2009GL041808

Dommenget, D., and M. Jansen, 2009: Predictions of Indian Ocean SST indices with a simple statistical model: a null hypothesis. *J. Climate*, 22, 4930–4938

Jansen, M., and R. Ferrari, 2009: Impact of the latitudinal distribution of tropical cyclones on ocean heat transport, *Geophys. Res. Lett*., 36, L06604, doi:10.1029/2008GL036796

Jansen, M.F., D. Dommenget, and N. Keenlyside, 2009: Tropical atmosphere–ocean interactions in a conceptual framework. *J. Climate*, 22, 550–567