Christina Schmidt

Climate Change Research Centre and Australian Centre for Excellence in Antarctic Science, University of New South Wales, Sydney, Australia

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Executive Summary

I am a Physical Oceanographer interested in what drives the ocean's circulation from small to large scales and how this affects the climate system. In particular, the dynamics and processes on the Antarctic margin and in the Southern Ocean are fascinating to me. I use advanced technical skills including high-resolution ocean-sea ice models and Lagrangian methods to better understand changes in the ocean's circulation.

Education

05/2021 - present **PhD** in Physical Oceanography and Climate Science

Climate Change Research Centre and Australian Centre for Excellence in Antarctic Science, University of New South Wales, Sydney, Australia

Thesis: Antarctic Bottom Water formation and dynamics in a changing climate

Supervisors: Prof. Matthew England, Dr. Adele Morrison

Funded by a full tuition and living allowance University International Postgraduate Award (valued at approximately AUD 330,000)

10/2017 - 02/2020 **Master of Science** in Climate Physics: Meteorology and Physical Oceanography

Christian-Albrechts-Universität zu Kiel and GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany. Supervisors: Prof. A. Biastoch, Dr. S. Schmidtko

Professional Experience

07/2024-08/2024 Graduate **teaching assistant** for "Physical Oceanography (MSCI3001)", University of New South Wales, Sydney, Australia

03/2020 – 01/2022 **Research Scientist** (part time) in the research unit Ocean Dynamics, GEOMAR Helmholtz Centre for Ocean Research Kiel. Supervisor: Prof. A. Biastoch

Analysis of components of the Atlantic Meridional Overturning Circulation (Agulhas leakage, overturning in the subpolar North Atlantic) in high-resolution ocean-sea ice models with Eulerian and Lagrangian techniques

Publications

9. **Schmidt, C.**, Morrison, A. K., England, M. H., Aguiar, W., & Gibson., A. (under review in Journal of Advances in Modeling Earth Systems). **Sensitivity of Antarctic Bottom Water formation and export to horizontal model resolution**. ESS Open Archive, August 26, 2024. **https://doi.org/10.22541/essoar.172469193.39598080/v1**

8. Harrison, T., Bracegirdle, T., Davrinche, C., Dutrieux, P., Gilbert, E., Haigh, M., Jones, J., Kent, E., King, J., Lu, H., Price, R., **Schmidt, C.,** Vignon, É., & Wiener, V. (2024). **Advances and next steps in observing and modeling Antarctica's coastal winds.** *Bulletin of the American Meteorological Society,* 105(11), 2242-2248. https://doi.org/10.1175/BAMS-D-24-0247.1

7. Xie, Y., Spence, P., Corney, S., Tamsitt, V., Dawson, H., **Schmidt, C.**, & Bach, L. T. (2024). **Euphotic zone residence time of Antarctic Bottom Water**. *Geophysical Research Letters*, 51, e2023GL106342. https://doi.org/10.1029/2023GL106342

6. **Schmidt, C.**, Morrison, A. K., & England, M. H. (2023). **Wind– and sea-ice–driven interannual variability of Antarctic Bottom Water formation**. *Journal of Geophysical Research: Oceans*, 128(6). https://doi.org/10.1029/2023JC019774

5. Rühs, S., **Schmidt, C.**, Schubert, R., Schulzki, T., Schwarzkopf, F., Le Bars, D., & Biastoch, A. (2022). **Robust estimates for the decadal evolution of Agulhas leakage from the 1960s to the 2010s**. *Communications Earth & Environment,* 3(318). https://doi.org/10.1038/s43247-022-00643-y

4. Fox, A. D., Handmann, P., **Schmidt, C.**, Fraser, N., Rühs, S., Sanchez-Franks, A., Martin, T., Oltmanns, M., Johnson, C., Rath, W., Holliday, N. P., Biastoch, A., Cunningham, S. A., & Yashayaev, I. (2022). **Exceptional freshening and cooling in the eastern subpolar North Atlantic caused by reduced Labrador Sea surface heat loss**. *Ocean Science*, 18, 1507–1533. https://doi.org/10.5194/os-18-1507-2022

3. **Schmidt, C.,** Schwarzkopf, F., Rühs, S., & Biastoch, A. (2021). **Characteristics and robustness of Agulhas leakage estimates: an inter-comparison study of Lagrangian methods**. *Ocean Science*, *17*(4), 1067–1080. https://doi.org/10.5194/os-17-1067-2021

2. Benestan, L., Fietz, K., Loiseau, N., Guerin, P. E., Trofimenko, E., Rühs, S., **Schmidt, C.,** Rath, W., Biastoch, A., Pérez-Ruzafa, A., Baixauli, P., Forcada, A., Arcas, E., Lenfant, P., Mallol, S., Goñi, R., Velez, L., Höppner, M., Kininmonth, S., Mouillot, D., Puebla, O., & Manel, S. (2021). **Restricted dispersal in a sea of gene flow**. *Proceedings of the Royal Society B: Biological Sciences*, *288*(1951). https://doi.org/10.1098/rspb.2021.0458

1. Busch, K., Taboada, S., Riesgo, A., Koutsouveli, V., Ríos, P., Cristobo, J., Franke, A., Getzlaff, K., **Schmidt, C.,** Biastoch, A., & Hentschel, U. (2021). **Population connectivity of fan-shaped sponge holobionts in the deep Cantabrian Sea**. *Deep-Sea Research Part I: Oceanographic Research Papers*, *167*, 103427. https://doi.org/10.1016/j.dsr.2020.103427

Technical Skills

- Numerical modelling with eddy resolving ocean-sea ice models:
  - running ACCESS-OM2 at a horizontal resolution of 1/10°
  - development of a regional Southern Ocean model using MOM6 at resolutions of 1/10°, 1/20°, 1/40°
  - analysis of NEMO output
- Big data analysis and visualisation using python (xarray, dask)
- High Performance Computing
- Lagrangian analysis (Parcels)
- Version control with github

Presentations at Conferences and Workshops (Selected)

Since 2021, I gave 18 talks at national and international meetings and conferences. The full list is available at https://schmidt-christina.github.io/talks/.

Oral Presentation at **Australian Antarctic Research Conference**, Hobart, AUS, 18-22 November 2024

Oral Presentation (online) at **Workshop "Antarctic Coastal Winds: recent advances and future research priorities"**, British Antarctic Survey and online, Cambridge, UK, 19-21 March 2024

Seminar **"Polar Hour" at Scripps Institute of Oceanography**, San Diego, USA, 29 February 2024

Oral Presentation & Poster at **Ocean Sciences Meeting**, New Orleans, USA, 18-23 February 2024

Oral Presentation at **28th IUGG General Assembly**, Berlin, Germany, 11-20 July 2023

Oral Presentation at **Ocean Sciences Meeting**, online, 1-4 March 2022

Awards

2024 **Best Lightning Talk**, Ocean Modelling and Observations Workshop, Canberra

2024 **Best Student Presentation** at the biannual postgraduate reviews of the Climate Change Research Centre, University of New South Wales

2023 Climate Change Research Centre **Prize for Science Communication, Outreach or Education**, University of New South Wales

2023 **Best Lightning Talk**, Annual forum of the Australian Centre for Excellence in Antarctic Science

2020 **University International Postgraduate Award** for study towards a PhD valued at approx. AUD 330,000 covering tuition fees and a stipend, University of New South Wales

Engagement, Impact and Leadership

04/2023 – 12/2024 **Chair of the Early Career Researcher Committee**, Australian Centre for Excellence in Antarctic Science

01/2023 – 12/2024 Volunteer in the **social media team** responsible for the twitter (@ccrc_unsw) and bluesky (@ccrc.bsky.social) accounts of the Climate Change Research Centre

11/2023 **Session Convenor** and member of the **organizing committee**, Annual research forum of the Australian Centre for Excellence in Antarctic Science, Australia, 8-9 November

Reviewer for Communications Earth & Environment, Ocean Science

Short courses, Summer and Winter Schools

2024 Winter School on "**Sea Level Change**" by the Australian Centre for Excellence in Antarctic Science and Australian Antarctic Program Partnership, Australia, 17-21 June

2023 **Media training** in a TV- and radio-studio, Stupid Old Studios, Australia, 27 November

2023 DPG Summer School **"Physics of the Ocean"**, Physikzentrum Bad Honnef, Germany, 2-7 July

2023 Winter School on "**Sea Ice - biology to physics**" by the Australian Centre for Excellence in Antarctic Science and Australian Antarctic Program Partnership, Australia, 22-26 May

Sea-going Experience

11/2019 M159 on *RV Meteor* in the **tropical Atlantic** (28 days)
Mooring re-deployment, mooring data processing, oxygen titration, CTD watch

05/2016 MSM54 on *RV Maria S. Merian* in the **subpolar North Atlantic** (24 days)
Mooring re-deployment, CTD watch

03/2016 M124 on *RV Meteor* in the **South Atlantic** (18 days)
Underway CTD and XBT, CTD watch

Referees

Professor Matthew England
University of New South Wales, Sydney, Australia
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Dr. Adele Morrison
Australian National University, Canberra, Australia
adele.morrison@anu.edu.au

Professor Arne Biastoch
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