

ACADEMIC RECORD

06.26 – Present Max Planck Institute for Meteorology, Germany Post-Doctorate in the Climate Physics Department

- Awarded Susanne Hasselmann Fellowship
- Co-supervising a PhD Student
- Awarded funding to hire a research software engineer as part of the PHEONIX European Lighthouse code project

04.22 – 03.26 Max Planck Institute for Meteorology, Germany Summa cum laude PhD in the Climate Physics Department

- Dissertation grade: summa cum laude; oral defense grade: magna cum laude, 1.0.
- Created Cleo, a novel implementation in C++/Kokkos of the super-droplet method for warm-cloud microphysics, from scratch
- Successfully awarded two NatESM sprint projects, in which I supervised two research software engineers for a total of one year
- Participated as radar and radiometer operator during ORCESTRA field campaign
- Co-supervised a Master's student, resulting in a co-first-author publication

10.17 – 06.21 University of Cambridge, Robinson College, UK First Class Honours in Natural Sciences (BA and MSc), specialising in Physics

- Awarded Microsoft Research Prize for Master's project, graded 91.6%
- Awarded Mathers Prize in Physical Natural Sciences for academic merit throughout Master's
- Awarded College Scholarship in first year, re-awarded throughout Bachelors
- Awarded College Prize in first year
- First year: Class 1. Physics, Mathematics, Chemistry, Earth Science
- Second year: Class 2.1. Physics & Earth Science
- Third year (no classing in Covid-19) Coursework: Theoretical Physics 68.0%, Research Review 72.5%, Computing Project 75.4%, Computing 80.0%
- Master's year: Class 1. Top 13th in overall grade

SCIENTIFIC PUBLICATIONS

In Preparation

- **Bayley, C. J. A.**, Ware, E., Arabas, S.: *SDM as a Numerical Benchmark for Warm-Rain Processes?*, 2026 (in prep.).
- Windmiller, J., Groß, S., Stevens, B., Ament, F., Mayer, B., Wendisch, M., Wu, Y., et al. **incl. Bayley, C. J. A.**: *PERCUSION's contribution to ORCESTRA*, 2026 (in prep.).

2026

- **Bayley, C. J. A.**: *Design and First Applications of Cleo, a Flexible Superdroplet Model for Warm-Cloud Physics on High-Performance Computers*, PhD thesis, Hamburg: Max Planck Institut für Meteorology, 10.17617/2.3717814, 2026.

- **Bayley, C. J. A.**, Kölling, T., Naumann, A. K., Vogel, R., and Stevens, B.: *Cleo: the fundamental design of a new superdroplet model for high computational performance (v0.39.0)*, Geosci. Model Dev., 19, 6099–6120, doi:10.5194/gmd-19-6099-2026, 2026.
- **Bayley, C. J. A.**, Naumann, A. K., Poydenot, F., Vogel, R., Stevens, B., and Shima, S.-I.: *Cleo: the numerical methods of a new superdroplet model including a droplet breakup algorithm (v0.52.0)*, Geosci. Model Dev., 19, 6121–6142, doi:10.5194/gmd-19-6121-2026, 2026.
- **Bayley, C. J. A.***, Niebaum, N.* , Poydenot, F., Naumann, A. K., Sarkar, M., and Vogel, R.: *Constraining Rain Evaporation from Shallow-Clouds in the Trades using an Observation-Based Superdroplet Model*, EGUsphere [preprint], doi:10.5194/egusphere-2025-5551, 2025. *These authors contributed equally.

2025

- Segura, H., **Bayley, C. J. A.**, et al.: *A single tropical rainbelt in global storm-resolving models: The role of surface heat fluxes over the warm pool*, Journal of Advances in Modeling Earth Systems, 17, e2024MS004897, doi:10.1029/2024MS004897, 2025.

SCIENTIFIC RESEARCH PLACEMENTS

2024 ORCESTRA Field Campaign, Cape Verde and Barbados

- one of the lead operators of the radar and radiometers aboard the HALO research aircraft for two months
- collected and post-processed raw I/Q and first-level-processed radar data
- communicated post-processed data to members of the EarthCARE satellite mission
- re-wrote substantial parts of the operating manual

2023 Research Visit, Japan

- visited Prof. Shin-ichiro Shima for 3 months
- developed novel algorithm to model collisional breakup and rebound of droplets
- improved the numerical methods for condensation/evaporation in the super-droplet model, Cleo

2019 – 2022 Pre-PhD Research Placements, UK and Germany

- Astrophysics Computational Modelling Placement at Universität zu Köln (2021/22)
- Chalmers Astrophysics & Space Science Summer (CASSUM) research fellowship (2021)
- Climate Physics Placement at Imperial College London Space and Atmospheric Physics Group, joint with the Leverhulme Centre for Wildfire Research (2020)
- Black Hole Astrophysics Placement at the Mullard Space Science Laboratory (2019)

CO-CURRICULAR INTERESTS AND SKILLS

Women in STEM:

- Co-first author of the km-scale summit statement on under-representation (2026; in prep.)
- Lead-organiser of the MPI-M Menstruation products initiative (2023 – present)
- Participated in the Conference for Undergraduate Women in Physics (2019)
- Co-chaired a panel discussion at Cambridge about women in STEM (2018)

Additional:

- Foreign languages: German (B2, conversational)
- Cello: grade 7 (2002-present)
- Sport: football; swimming; kung fu (president of club and silver medallist, 2015 – 2023)
- Gardening: happily (founder of the Robinson College Gardening Society, 2018 – 2020)
- MPI-M social media editorial team member (2022-2026)