

## Education

- Since 2022 **Doctoral Studies**, *Universität Mainz*, PhD in Atmospheric Physics.  
Research on clouds and dynamics of warm conveyor belts (WCBs), with a focus on the role of convection, grid-resolution and physical parameterizations on modeled cloud formation and moisture transport.
- 2019–2021 **Masters**, *Universität Heidelberg*, Physics, grade: 1.0 (best possible grade).  
Specialization in environmental physics (aquatic, atmospheric, terrestrial and climate physics, radiation, computational modeling).
- 2015–2019 **Bachelor**, *Universität Heidelberg*, Physics, grade: 1.9 (best: 1.0, passing: 4.0).  
Courses on theoretical and experimental physics, mathematics, programming.

## Research Experience

- Since 2022 **Doctoral Research**, with *Annette Miltenberger*, *University Mainz, Germany*.
  - PhD within the TPChange research collaboration (Project B08-1, <https://tpchange.de/>).
  - Designed and ran km-scale ICON simulations of WCBs and analyzed the role of convection, grid-resolution and microphysical parameterizations for vertical moisture transport and cloud formation.
  - Developed novel Lagrangian formulations for the analysis of microphysical processes in clouds and implemented high-performance computing scripts to efficiently process, mask, and bin large 4D datasets.
  - Validated model output against observations from the geostationary METEOSAT Second Generation satellite using RTTOV, feature tracking (TOBAC) and deep learning.
  - Presented results at international conferences (EGU, ICCARUS, ICCP in South Korea) and performed scientific outreach at the LCOY-2024 youth climate conference (included developing a role-playing game for understanding scientific collaborations—earning a follow-up invitation for LCOY-2025).
  - Authored one peer-reviewed publication (ACP), one pre-print (ACP) and two further publications in preparation as first author. Further publications as co-author (see below).
- Sept 2021 - **Research Associate**, with *Bertram Boehrer*, *Environmental Research Centre Magdeburg (UFZ)*.  
Jan 2022 Authored two peer-reviewed publications as first author (full references below), earning the first place for the Schwoerbel-Benndorf Nachwuchspreis (Young Talent Award) from the German Limnological Society (DGL).
- 2021 **Master's Thesis**, with *Bertram Boehrer* and *Werner Aeschbach-Hertig*, *University of Heidelberg and the Environmental Research Centre Magdeburg (UFZ)*. Grade: 1.0 (best possible grade).  
Experimental measurements of noble gas solubilities at high temperatures and their implementation for the analysis of noble gas concentration measurements in Lake Kivu's deep water.
- Nov 2019 - **Academic assistant**, *research group for hydrogeography and climatology at the University of Heidelberg*.  
Feb 2020 Conducted field measurements and automatized the analysis of data.
- 2021 **Bachelor's Thesis**, with *Bernd Jähne*, *University of Heidelberg*. Grade: 1.0 (best possible grade).  
Physics of the air-water interface: expansion and implementation of the method of momentum balance in an annular wind-wave tank to measure the friction velocity under non-stationary conditions.
- March – April 2018 **Academic internship**, at the *Max-Planck Institute for Nuclear Physics, Heidelberg*.  
Evaluation of measurement data for the separation of N<sub>2</sub> molecules in intense laser pulses using python.

## Teaching Experience

- Since April 2025 **Supervising Master's Thesis**, *University of Mainz*.  
Co-supervising Master's thesis of Lisa Herdt titled "Observed moisture content in the upper troposphere / lower stratosphere (UTLS) over WCB outflow" (translated from German).

Since 2022 **Tutor (Teaching Assistant)**, *University of Mainz*.

- Taught *Clouds and Aerosols* for master's students and *Introduction to Meteorology* for first semester students.
- Created a role-playing game which simulates large research collaborations for the project practicals of students.
- Assisted in the lecture for Modeling and Data Analysis in Atmospheric Sciences.

2018-2021 **Tutor (Teaching Assistant)**, *University of Heidelberg*.

- Supervised laboratory work, demonstrated experiments and corrected protocols for the physics lab courses for students of physics, medicine and biotechnology.

## Publications

- In preparation (Two part study) Schwenk, C. and Miltenberger, A.: "Effects of Model Grid Spacing for Warm Conveyor Belt (WCB) Moisture Transport into the Upper Troposphere and Lower Stratosphere (UTLS)— Part I: Lagrangian Analysis and Part II: Eulerian Analysis"
- Submitted Schwenk, C., Miltenberger, A., Oertel, A.: "Microphysical Parameter Choices Modulate Ice Content and Relative Humidity in the Outflow of a Warm Conveyor Belt", Submitted to *Atmos. Chem. Phys.*, currently with the handling editor.
- 2025 Joppe, P., Schneider, J., Wilsch, J., Bozem, H., Breuninger, A., Curtius, J., Ebert, M., Emig, N., Hoor, P., Ismayil, S., Kandler, K., Kunkel, D., Kurth, I., Lachnitt, H.-C., Li, Y., Miltenberger, A., Richter, S., Rolf, C., Schneider, L., Schwenk, C., Spelten, N., Vogel, A. L., Cheng, Y., and Borrmann, S.: "Transport of Biomass Burning Aerosol into the Extratropical Tropopause Region over Europe via Warm Conveyor Belt Uplift", *EGUsphere* [preprint], <https://doi.org/10.5194/egusphere-2025-1346>, 2025.
- 2024 Schwenk, C. and Miltenberger, A.: "The role of ascent timescales for warm conveyor belt (WCB) moisture transport into the upper troposphere and lower stratosphere (UTLS)", *Atmos. Chem. Phys.*, 24, 14073–14099, <https://doi.org/10.5194/acp-24-14073-2024>
- 2022 Schwenk, C., Negele, S., Balagizi, C. M., Aeschbach, W., Boehrer, B. (2022): "High temperature noble gas thermometry in Lake Kivu, East Africa", *Science of the Total Environment*, 837, 155859. <https://doi.org/10.1016/j.scitotenv.2022.155859>
- 2022 Schwenk, C., Negele, S., Aeschbach, W., Boehrer, B.: "Extending noble gas solubilities in water to higher temperatures for environmental application", *ACS J. Chem. Eng. Data*, 67 (2022), pp. 1164-1173, 10.1021/acs.jced.2c00009
- 2021 Boehrer, B., Jordan, S., Leng, P., Waldemer, C., Schwenk, C., Hupfer, M., Schultze, M.: "Gas pressure dynamics in small and mid-size lakes", *Water*, 13, 1824. <https://doi.org/10.3390/w13131824>

## Talks and Conferences (Selection)

- 2025 EGU 2025 General Assembly, Vienna, Austria (two talks): "How does Model Grid Resolution Influence Mixed-Phase Processes and UTLS Moisture Transport by a WCB?" and "Making Research more Tangible through Role-Playing: A Game-Based Approach to Understanding Large Scientific Collaborations".
- 2024 ICCP 2024, Jeju, South Korea and EGU 2024 General Assembly, Vienna, Austria: "A Lagrangian investigation of the (micro)physical processes controlling warm conveyor belt moisture transport and cloud properties", talk.
- 2024 LCOY 2024 (German Youth Climate Conference) Berlin, Germany: "Hands-on climate research: how do clouds influence the climate? And what does this have to do with geoengineering?" (translated title from german), talk.
- 2023 EGU 2023 General Assembly, Vienna, Austria: "Physical processes controlling warm conveyor belt moisture transport to the UTLS and dependence on model resolution, talk.
- 2022 DACH 2022 Meteorology Conference, Leipzig, Germany: "Creating high Temperature Noble Gas Solubility Functions to analyse missing Noble Gases in Lake Kivu's deep Water", talk, also at SIL 100, Congress of the International Society of Limnology, Berlin, Germany.

## Scholarships and prizes

- 2023, 2025 **Best Poster Presentation Award**, *TPChange Annual Meeting 2023 and 2025*.
- 2022 **Schwoerbel-Benndorf Young Scientist Award**, *German Limnological Society (DGL)*, First place recipient of the *Schwoerbel-Benndorf Nachwuchspreis* in recognition of outstanding research in the field of limnology, reflecting both scientific innovation and dedication to environmental research.
- 2014 **Student of the Year**, *Copenhagen International School*, Recognized for academic performance and significant contributions to school life, including active participation in extracurricular activities such as sports, theatre, and music, as well as for fostering a positive, supportive community.

2012-2014 **Academic Scholarship**, *Copenhagen International School*, Awarded a scholarship that fully funded all extracurricular music classes and activities, as well as sports.

## Skills

- Languages German (native), English (native), Danish (proficient), French (medium proficiency, with room for improvement).
- Programming Proficient in **Python** (xarray, netCDF4, SciPy, pandas, Matplotlib, PyTorch) and **Julia** (NCDatasets, multithreading, DecisionTrees) for data analysis, visualization and machine learning and high-performance numerical workflows; **Fortran** for ICON NWP model usage/development. Experience with HPC job scheduling (**Slurm**), version control (**Git**), shell scripting (**Bash**) and document preparation (**LaTeX**).
- Computer Linux/Debian, Windows (Powerpoint, Word, Excel), Anaconda, Jupyter Notebook.
- Soft Skills Public speaking, teaching, communication of scientific results, group/team work (and supervising), international sensibilities and cross-cultural communication skills (multicultural upbringing in a diplomatic environment).

## Interests and Hobbies

- Hobbies I take great interest in history, advances in natural sciences and in environmental protection. I participate in scientific outreach (LCOY conference) and have organized local support for climate action.
- Passions Combating climate change, advocating for sustainable energy and practices, striving for a more ethical, environmentally responsible future, feminism and gender equality. I also enjoy hiking, skiing, surfing, making music and playing team sports.