

Dr. Marcus Klingebiel

- Atmospheric scientist with a passion for data science
- Mission lead for Arctic airborne measurement campaigns

- Expert in cloud observations from aircraft, ground and space
- Teaching and supervising students in research

Contact

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Skills

PROGRAMMING

Python
IDL
Fortran
Delphi
IGOR Pro

SOFTWARE & TOOLS

Data processing
numpy, pandas, ...
Visualization
matplotlib, cartopy, ...
LaTeX
Git

Methods & data

Satellite data (EarthCARE, MODIS)
Reanalyses (ERA5)
Radiative transfer (libRadtran)
Retrieval methods Self-organizing maps
Image analysis Trajectories (LAGRANTO)
Radar, lidar, spectrometers
Raspberry Pi, Arduino
macOS, Linux, Windows

Languages

German native
English fluent, also in daily life

Teaching & supervision

Lectures & exercises
Leipzig University (lectures with a professor)
Bachelor theses
Supervised several students
(AC)³ winter school 2025
Led a working group

Education

PhD, magna cum laude
University of Mainz, 2015
Diplom (M.Sc. equivalent)
in Meteorology
University of Hannover, 2011

About me

I am specialized in cloud research, using in-situ measurements as well as active and passive remote sensing from aircraft and ground-based platforms.

My core competencies are data processing and analysis and the development of methods to derive complex products such as cloud microphysical properties. My work has appeared in more than 25 peer-reviewed articles, 7 of them as first author ([list of publications](#)).

As mission lead of international airborne campaigns, I was responsible for planning, coordination and operations. In my spare time I develop software such as the macOS app KView.

Scientific career

05/2020 – present

Leipzig University · Leipzig Institute for Meteorology · Postdoctoral researcher

- Co-PI of the airborne campaigns HALO-(AC)³ (2022), COMPEX-EC (2025, Kiruna; validation of the EarthCARE satellite) and COMPEX (2026)
- Evolution of cloud streets in Arctic cold-air outbreaks from airborne, satellite and reanalysis data; classification of cloud regimes with self-organizing maps
- Retrieval of cloud microphysical properties (effective radius, optical thickness) from imaging spectroscopy using radiative transfer simulations
- Submitted my own DFG proposal (36 months) on clouds in Antarctic cold-air outbreaks using EarthCARE (2026)

01/2016 – 04/2020

Max Planck Institute for Meteorology · Hamburg · Postdoctoral researcher

- Algorithms to characterize atmospheric phenomena: retrieval of aerosol size distributions, segmentation of shallow cumulus clouds
- Analysis of multi-year Ka-band Doppler cloud radar and Doppler lidar data; NARVAL and EUREC4A campaigns

01/2015 – 12/2015

Max Planck Institute for Chemistry · Mainz · Associate researcher

- Quantitative analysis and physical interpretation of cloud droplet size distributions

09/2011 – 12/2014

Johannes Gutenberg University Mainz · Institute for Atmospheric Physics · PhD researcher

- PhD thesis: *Airborne in-situ measurements of the ice and liquid phase of tropospheric clouds* (in German)
- Airborne in-situ campaigns on Arctic stratiform clouds and cirrus; further development of the towed sensor platform AIRTOSS

Selected publications

2026

Observational validation of boundary-layer cloud regimes in Arctic cold air outbreaks · *Geophys. Res. Lett.*

2025

Airborne observations of cloud properties during their evolution from organized streets to isotropic cloud structures along an Arctic cold-air outbreak · *Atmos. Chem. Phys.*

2023

Variability and properties of liquid-dominated clouds over the ice-free and sea-ice-covered Arctic Ocean · *Atmos. Chem. Phys.*

2021

Measuring shallow convective mass flux profiles in the trade wind region · *J. Atmos. Sci.*

2019

Remote sensing of sea salt aerosol below trade wind clouds · *J. Atmos. Sci.*

All first-authored. In addition, 5 own datasets (PANGAEA, AERIS) – [full list](#).