

Curriculum Vitae

Dr. Ulrike Burkhardt
Institut für Physik der Atmosphäre
DLR, Oberpfaffenhofen
82234 Weßling
08153/28 2561
Ulrike.Burkhardt@dlr.de

Education

1992: Diplom in Meteorology at the Free University Berlin
1996: Doctorate from the faculty of Physics of Ludwig-Maximilians Universität München
1996-2002: Postdoc at the Meteorological Institute of the University of Reading, UK.
Since 2003: Scientist at the DLR Institute for Atmospheric Physics, Oberpfaffenhofen.
2014 Sabbatical at Lawrence Livermore Laboratories, Livermore, USA.

Research areas:

20+ years of experience in climate modelling in general and, in particular, in developing parameterizations for cirrus and contrails, evaluating respective simulations and estimating the climate impact of aircraft induced cloud perturbations and associated cloud adjustments.

Since 2005 specialization on simulating ice clouds and their anthropogenic perturbations:

- Developing consistent parameterizations in climate and high-resolution models
- Evaluating simulations of the formation and evolution of natural ice clouds and contrail cirrus
- Studying processes controlling contrail life cycles
- Analyzing the impact of contrail formation on cloudiness including the interaction between natural clouds and contrails
- Estimating the climate of contrail formation
- Evaluating contrail mitigation options using alternative fuels or different combustor technology

Projects, coordination, committees:

- Participation in many projects relating to contrail cirrus ranging from DLR, BMBF, BMWi, EU, Airbus to the FAA ACCRI project.
- Member of the steering committee of the German wide HD(CP)2 (High definition cloud and precipitation for climate prediction) project funded by the BMBF and of the international IN2clouds Workshop.
- Coordination of projects within HD(CP)2 and within VI-ACI (Aerosol Climate Interactions).
- Coordination of the Matrix group 'Ice Clouds' at the DLR institute of Atmospheric Physics from 2014 to 2024.
- Member of the German delegation for intensifying climate research in cooperation with China representing the HD(CP)2 project.

Top 10 peer reviewed publications:

Bier, A., & Burkhardt, U. (2022). Impact of parametrizing microphysical processes in the jet and vortex phase on contrail cirrus properties and radiative forcing. *Journal of Geophysical Research: Atmospheres*, 127, e2022JD036677. <https://doi.org/10.1029/2022JD036677>

Verma, P., & Burkhardt, U. (2022). Contrail formation within cirrus: ICON-LEM simulations of the impact of cirrus cloud properties on contrail formation. *Atmospheric Chemistry and Physics*, 22(13), 8819–8842. <https://doi.org/10.5194/acp-22-8819-2022>

Lee, D. S., Fahey, D. W., Skowron, A., Allen, M. R., Burkhardt, U., Chen, Q., et al. (2021). The contribution of global aviation to anthropogenic climate forcing for 2010 to 2018. *Atmospheric Environment*, 244, 117834. <https://doi.org/10.1016/j.atmosenv.2020.117834>

Stevens, B., Acquistapace, C., Hansen, A., Heinze, R., Klinger, C., Klocke, D., et al. (2020). The added value of large-eddy and storm-resolving models for simulating clouds and precipitation. *Journal of Meteorological Society of Japan*, 98(2), 395–435. <https://doi.org/10.2151/jmsj.2020-021>.

Bock, L., and U. Burkhardt, 2019: Contrail cirrus radiative forcing for future air traffic. *Atmos. Chem. Phys.*, 19, 8163–8174, <https://doi.org/10.5194/acp-19-8163-2019>.

Burkhardt, U., L. Bock and A. Bier, 2018: Mitigating the contrail cirrus climate impact by reducing aircraft soot number emissions. *npj Climate and Atmospheric Science*, p. 1-7. <https://doi.org/10.1038/s41612-018-0046-4>

Kärcher, B., Burkhardt, U., Bier, A., Bock, L., and Ford, I. J. (2015): The microphysical pathway to contrail formation, *J. Geophys. Res.*, 120, 7893–7927, <https://doi.org/10.1002/2015JD023491/2015JD023491>

Burkhardt, U., & Kärcher, B. (2011). Global radiative forcing from contrail cirrus. *Nature Climate Change*, 1(1), 54–58. <https://doi.org/10.1038/NCLIMATE1068>

Kärcher, B. and U. Burkhardt, 2008: A Cirrus cloud scheme for general circulation models. *Q. J. Roy. Meteorol. Soc.*, 134, 1439-1461, <https://doi.org/10.1002/qj.301>

Principal author of the Aviation Climate Change Research Initiative (ACCRI) publication *A Report on the Way Forward Based on the Review of Research Gaps and Uncertainties* Coordinating lead author: G.P. Brasseur, Environmental Working Group of the U.S. NextGen Joint Planning and Development Office Federal Aviation Authority (FAA), National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), 2008.