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Franziska Vogel

Nationality: German **Date of birth:** 06/12/1993 **Gender:** Female **Phone:** (+39) 3516076476

Email: franziskabarbaravogel@web.de

Home: Via Ruggero Grieco 2, 40133 Bologna (Italy)

ABOUT MYSELF

My main interest is the improved predictability of cloud processes induced by small and large scale meteorological events. This interenst developed during my master studies in meteorology and evolved during my PhD when I participated in projects aiming to better understand the role of atmospheric aerosol in hydrometeorological extremes, agricultural frost damages and desertifications feedbacks.

PROFILE

Scientific background

Measurements of atmospheric aerosol properties and ice formation during extreme events (convection, heat waves, dust storms)
Python code development for statistical analysis of long-term aerosol data sets

Backward air mass trajectory analysis

Use of open-access climatic data bases (EBAS, ERA-5)

Planning, conducting and analyzing measurement campaigns within larger groups

Discussion of my work within a large colaboration of experimentalists and modellers

WORK EXPERIENCE

Postdoctoral Researcher

Institute of Atmospheric Sciences and Climate (ISAC), National Research Council (CNR) [16/10/2023 – Current]

City: Bologna | **Country:** Italy

Development of tools to systematically identify Saharan dust transport events over Italy
Analysis of 20 years of data of aerosol particle properties and back trajectories at the GAW global station of Mt. Cimone

Postdoctoral Researcher

Institute of Meteorology and Climate Research, Karlsruhe Institute of Technology [01/07/2022 – 30/09/2023]

City: Karlsruhe | **Country:** Germany

Size-selective ice- nucleating particle measurements with different online and offline instruments
Developments to improve the Portable Ice Nucleation Experiment (PINE)
Organization of laboratory and field campaigns

EDUCATION AND TRAINING

PhD - Meteorology

Institute of Meteorology and Climate Research, Karlsruhe Institute of Technology [01/02/2019 – 10/06/2022]

City: Karlsruhe | **Country:** Germany | **Field(s) of study:** Atmospheric Ice-Nucleation ; Meteorology ; Atmospheric aerosol characterization | **Final grade:** 1,0 (magna cum laude) | **Level in EQF:** EQF level 8 | **Thesis:** Short-term Variation in Measurements of Atmospheric Ice-Nucleating Particle Concentrations

Atmospheric ice-nucleating particle measurements
Development of a new small cloud expansion chamber
Supervising and conducting campaigns at the AIDA ACTRIS national facility and in the field
Analysis of large data sets

CLOUD-MOTION Summer School

[06/2019]

City: Wengen | **Country:** Switzerland

Aerosol physics
New particle formation
Aerosol characterization

Master of Science - Meteorology

Karlsruhe Institute of Technology [01/10/2016 – 31/01/2019]

City: Karlsruhe | **Country:** Germany |
Field(s) of study: Natural sciences, mathematics and statistics ; Meteorology | **Final grade:** 1,3 (on a scale from 1,0 to 5,0) | **Level in EQF:** EQF level 7 | **Thesis:** First field application of a mobile expansion chamber to measure ice nucleating particles

Atmospheric modelling
Experimental meteorology
Cloud and aerosol physics
Remote sensing

Bachelor of Science - Meteorology

Karlsruhe Institute of Technology [01/10/2013 – 30/09/2016]

City: Karlsruhe | **Country:** Germany |
Field(s) of study: Natural sciences, mathematics and statistics ; Meteorology | **Final grade:** 2,1 (on a scale from 1,0 to 5,0) | **Level in EQF:** EQF level 6 | **Thesis:** Laboratory experiments on the ice nucleation activity of desert dust aerosol at temperatures of the upper troposphere

Experimental physics
Theoretical physics
Advanced mathematics
Theoretical meteorology
Synoptic meteorology and weather forecast
Statistics and numeric methods

PROJECTS

MOSES (Modular Observation Solutions for Earth Systems), Germany Project goal: improve predictability of hydro-meteorological extremes (local-scale convection and heat-waves)
Unit goal: improve predictability of ice formation in local-scale concevtive cells

- Real time measurements of aerosol properties
- Real time measurements of ice formation
- Discussion of results with modellers for intergration in operational model (ICON-ART)

Link: https://www.ufz.de/moses/index.php?en=44514

LIFE-FROSTDEFEND, Greece Project goal: Development and implementation of forecast tools to reduce potential frost demage on agricultural crops
Unit goal: Monitoring of aerosol properties and cloud microphysics

- Real time measurements of the atmospheric aerosol concentration and ice formation

The project has received funding from LIFE Programme of the European Union under grant agreement n. LIFE20 CCA/GR/001747n

Link: https://frostdefend.eu/en/

J-WADI, Jordan and MICOS, Germany Project goal: Improved understanding of large desert dust particles emissions and their link to regional and global climate
Unit goal: Emission of large desert dust particles and its connection to meteorological conditions and their impact on atmospheric ice formation

- Real time measurements of the emission fluxes in the Wadi Rum desert in Jordan
- Atmospheric simulation chamber experiments on the impact of large dust aerosol on cloud microphysics

Links: https://www.imk-tro.kit.edu/11800.php | https://www.imk-tro.kit.edu/english/12165.php

PUBLICATIONS

Diurnal cycle of bioaerosols is a key driver of ice nucleating particle variability for Eastern Mediterranean orographic clouds Gao et al., 2024 - under revision at *npj Climate and Atmospheric Science*
https://www.researchsquare.com/article/rs-4378562/v1

Ice-nucleating particles active below -24 °C in a Finnish boreal forest and their relationship to bioaerosols Vogel et al., 2024, Atmospheric Chemistry and Physics (preprint; accepted for publication 20th August, 2024)
https://egusphere.copernicus.org/preprints/2024/egusphere-2024-853/

Biological and dust aerosols as sources of ice-nucleating particles in the eastern Mediterranean: source apportionment, atmospheric processing and parameterization Gao et al., 2024 - Atmospheric Chemistry and Physics (preprint; accepted for publication 8th July, 2024)
https://egusphere.copernicus.org/preprints/2024/egusphere-2024-511/

Molecular Understanding of the Enhancement in Organic Aerosol Mass at High Relative Humidity Surdu et al., 2023 - Environmental Science & Technology
https://pubs.acs.org/doi/full/10.1021/acs.est.2c04587

Development and validation of a new cloud simulation experiment for lab-based aerosol–cloud studies Vogel et al., 2022 - Review of Scientific Instruments
https://doi.org/10.1063/5.0098777

Short-term Variation in Measurements of Atmospheric Ice-Nucleating Particle Concentrations Vogel, 2022 - KIT library
https://publikationen.bibliothek.kit.edu/1000151147

Swabian MOSES 2021: An interdisciplinary field campaign for investigating convective storms and their event chains Kunz et al., 2022 - Frontiers in Earth Science

https://www.frontiersin.org/articles/10.3389/feart.2022.999593

Synergistic HNO3–H2SO4–NH3 upper tropospheric particle formation Wang et al., 2022 - Nature
https://doi.org/10.1038/s41586-022-04605-4

Measurement report: Introduction to the HyICE-2018 campaign for measurements of ice-nucleating particles and instrument inter-comparison in the Hyytiälä boreal forest Brasseur et al., 2022 - Atmospheric Chemistry and Physics
https://doi.org/10.5194/acp-22-5117-2022

Laboratory and field studies of ice-nucleating particles from open-lot livestock facilities in Texas Hiranuma et al., 2021 - Atmospheric Chemistry and Physics
https://doi.org/10.5194/acp-21-14215-2021

The Portable Ice Nucleation Experiment (PINE): a new online instrument for laboratory studies and automated long-term field observations of ice-nucleating particles Möhler et al., 2021 - Atmospheric Measurement Techniques
https://doi.org/10.5194/amt-14-1143-2021

The seasonal cycle of ice-nucleating particles linked to the abundance of biogenic aerosol in boreal forests Sc hneider et al., 2021 - Atmospheric Chemistry and Physics
https://doi.org/10.5194/acp-21-3899-2021

CONFERENCES & SEMINARS

[01/2022] Online
American Meteorological Society (AMS) Annual Meeting Effects of PM1 size selection on the ice nucleation ability of aerosol particles measured in a rural environment in spring and summer (oral presentation)

[09/2020] Online
European Aerosol Conference (EAC) Setup and application of the new small expansion chamber AIDAm for cloud simulation experiments (poster)

[01/2020] Boston
3rd Atmospheric Ice Nucleation Conference (AINC) Designing calibration experiments for instruments measuring ice-nucleating particles (poster)

[04/2019] Vienna
European Geoscience Union (EGU) General Assembly First long-term field measurements of ice-nucleating particles with a mobile expansion chamber (oral presentation)

LANGUAGE SKILLS

Mother tongue(s): German

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C1

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C1

French

LISTENING A2 **READING** A2 **WRITING** A1

SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

Italian

LISTENING A2 **READING** A2 **WRITING** A1

SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

DIGITAL SKILLS

Microsoft Office / Matlab / Python / Hybrid Single-Particle Lagrangian Integrated (HYSPLIT) / DataBase Sql Server / ERA-5 data / Panoply (grib2 and netcdf reader)

DRIVING LICENCE

Driving Licence: B

Bologna, 03.09.2024