Prix Schläfli
since 1866

Laudatio for the Award Ceremony of the Prix Schläfli Geosciences 2021 of the Swiss Academy of Sciences (SCNAT) for Dr Fabian Mahrt

The jury of the Prix Schläfli 2021 in Geosciences of the Swiss Academy of Sciences (SCNAT), consisting of Christine Pümpin (University of Basel), Dr Naki Akcar (University of Bern), and Prof. Olivier Bachmann (ETH Zürich) has evaluated seven high quality applications and proposed to award the prize to Dr Fabian Mahrt for his publication entitled "The Impact of Cloud Processing on the Ice Nucleation Abilities of Soot Particles at Cirrus Temperatures". The board of the Platform Geosciences then unanimously endorsed the decision of the jury and awarded the Prix Schläfli 2021 in Geosciences to Dr Fabian Mahrt.

Dr Fabian Mahrt obtained his MSc degree in the Institute of Atmospheric and Climate Science, in the Department of Environmental System Science, at the ETH Zurich, and was awarded his PhD degree from the same institute in 2019. His advisors were Prof. U. Lohmann, and Dr Z. A. Kanji. Dr Fabian Mahrt is now a postdoctoral fellow at the University of British Columbia, in Vancouver, Canada.

The study proposed by Dr Fabian Mahrt focussed on the ability of soot particles to nucleate ice crystals, on the role of atmospheric aging of such soot particles, and their ability to contribute to cirrus cloud formation. This study revealed that ice nucleation on soot particles is constrained to temperatures below 233 °K, and to particles larger than ~100 nm in diameter, providing important constraints on the ice nucleation ability of atmospheric soot particles. The study could also demonstrate that Pore Condensation and Freezing (PCF) was a key mechanism for ice nucleation on soot particles.

One particular strength of Dr Mahrt's publication (and of his general approach to research) is the coupling between instrument development skills and extensive knowledge in atmospheric science. Such an integrative approach allowed the development of novel tools, which provided unique opportunities for advanced experiments, that have already led to follow-up studies. Next to his main research topic, Dr Mahrt also explored other directions, such as (1) the effect of sulfuric acid aging of soot particles on their ice nucleation ability, and (2) the characterization and testing an optical particle phase discriminator, used to discriminate cloud droplets and ice crystals in cloud chamber studies.

The jury of the Prix Schläfli was particularly impressed by Dr Mahrt's innovative and wide-ranging approach, shedding new light on mechanisms of the very important process of cloud formation, establishing a strong basis for a better understanding of environmental pollution and its influence on the global climate.

I would like to congratulate again Dr Mahrt on his excellent work, and wish him the best of luck for the future.

Prof. Olivier Bachmann, on behalf of the president of the Prix Schläfli 2020 Jury, Christine Pümpin.

Award Ceremony, Geneva, November 2021

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