

Kunfeng Gao

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**Education**

2017.09-2022.06 PhD., Thermophysical Engineering, Honors Doctoral Program, School of Energy and Power Engineering & Shenyuan Honors College of Beihang University, Beihang University, China

2019.09-2021.10 Visiting PhD, Institute of Atmospheric and Climate Science, ETH Zurich, Switzerland

2016.02-2016.12 Exchange for BSc, Edith Cowan University, Australia (High Distinction remarks)

2013.09-2017.07 BSc., Thermophysical Engineering, Shanghai University of Electric Power, China
GPA:3.72/4.0, GA:90.72/100, Rank: 1/31

Employment

2024.06-Now Ice nucleation laboratory in Atmospheric Physics Group (Prof. Ulrike Lohmann), Institute for Atmospheric and Climate Science, ETH Zurich ([Postdoc](#))

2023.02-2024.05 Laboratory of atmospheric processes and their impacts (LAPI, Prof. Athanasios Nenes), IIE ENAC, École Polytechnique Fédérale de Lausanne (EPFL) ([Postdoc](#))

Awards & Honors

- 2022 Outstanding PhD Graduate of Beihang University
- 2018 Admission Scholarship for PhDs of Beihang University
- 2017 Outstanding BSc Graduate of Shanghai
- 2017 Outstanding BSc Graduate of Shanghai University of Electric Power
- 2017 Outstanding BSc Graduate Dissertation of Shanghai University of Electric Power
- 2017 The Best Innovation Award in the Fifth Student Innovation and Entrepreneurship Forum of Shanghai
- 2015 National Scholarship of China for College Student

Research Experiences**2024.06-present Ice nucleation laboratory in Atmospheric Physics Group, ETHZ**

(Supported by Solar Radiation Management - MPS-SRM - 2023)

- To investigate effective synthesised INPs for cirrus clouds seeding and thinning so as to mitigate their warming effects.

2023.02- 2024.05 Laboratory of Atmospheric Processes and their Impacts, EPFL

(Supported by European Research Council "PyroTRACH" project /726165)

- [CALISHTO](#) campaign at Mt. Helmos, Greece, to reveal the cloud-aerosol interaction processes with a focus on the role of dust and biological particles.
- [PERICLES](#) campaign at an Alpine semi-urban site in Payerne, Switzerland, to study the abundance and ice nucleation ability of biological particles.
- Published one first-authorship manuscripts. Have one first-authorship manuscript under review and another two first-authorship manuscripts in preparation, also six papers with a co-authorship.

2017.9-2022.7 National Key Laboratory on Aero-Engines, Beihang University*(Supported by National Natural Science Foundation of China /91641119)*

- As the first student author, contributed to the second chapter in *Advanced Biofuels: Applications, Technologies and Environmental Sustainability*.
- A patent 'A Pneumatic Centrifugal nano-Particle Classifier' was authorized.

2019.9-2021.10 Ice Nucleation Lab, Institute for Atmospheric and Climate Science, ETH Zurich (Visiting PhD student employed by Beihang University)*(Supported by Chinese Scholarship Council /201906020041)*

- Investigated determinant properties for the ice nucleation of soot particles in the cirrus regime.
- Simulated different atmospheric aging processes, including sulfuric acid coating, organic content changes, ozonation and physical densification, as well as cloud processing, to investigate how a single aging process or combined ageing processes regulate soot ice nucleation in the cirrus regime.
- Have six papers published with a first-authorship and one paper published with a co-authorship. Also have a first-authorship manuscript under review.

Academic results**Published papers**

1. **Gao, K.**, Vogel, F., Foskinis, R., Vratolis, S., Gini, M. I., Granakis, K., et al. (2024), Biological and dust aerosol as sources of ice nucleating particles in the Eastern Mediterranean: source apportionment, atmospheric processing and parameterization. *Atmos. Chem. Phys.*, 24(17), 9939-9974. <https://doi.org/10.5194/acp-24-9939-2024> [Highlight article]
2. **Gao K.** & Kanji Z. A. (2024), Influence of Lowering Soot - Water Contact Angle on Ice Nucleation of Ozone-Aged Soot. *Geophysical Research Letters*. 51(7), e2023GL106926. <https://doi.org/10.1029/2023GL106926>
3. Foskinis, R., **Gao, K.**, Gini, M. I., Diapouli, E., Vratolis, S., Granakis, K., et al. (2024), The influence of the planetary boundary layer on the atmospheric state and cloud formation at an orographic site at the Eastern Mediterranean Tellus B *Chem. Phys. Meteorol.*, 76(1), 19-31. <https://doi.org/10.16993/tellusb.1876>
4. Georgakaki, P., Billault-Roux, A.-C., Foskinis, R., **Gao, K.**, Sotiropoulou, G., Gini, M., et al. (2024), Unraveling secondary ice production in winter orographic clouds through a synergy of in-situ observations, remote sensing and modeling. *npj Clim. Atmos. Sci.*, 7, 145. <https://doi.org/10.1038/s41612-024-00671-9>
5. Foskinis, R., Motos, G., Gini, M. I., Zografou, O., **Gao, K.**, Vratolis, S., et al. (2024), Drivers of droplet formation in east Mediterranean orographic clouds. *Atmos. Chem. Phys.*, 24(17), 9827-9842. <https://doi.org/10.5194/acp-24-9827-2024>
6. Mahrt F., Rösch C., **Gao K.**, Dreimol C., Zawadowicz M. A., and Kanji Z. A. (2023), Physicochemical properties affect ice nucleating abilities of biomass burning derived charcoal aerosols at cirrus and mixed-phase cloud conditions. *Atmospheric Chemistry and Physics*. 23(2): 1285-1308. <https://doi.org/10.5194/acp-23-1285-2023>
7. **Gao K.**, Zhou C.-W., Meier E. J. B., & Kanji Z. A. (2022), Ice nucleation activities of soot particles internally mixed with sulphuric acid at cirrus cloud conditions. *Atmospheric Chemistry and Physics*. 22 (7): 4985-5016. <https://doi.org/10.5194/acp-22-4985-2022>
8. **Gao K.**, Friebel F., Zhou C.-W., & Kanji Z. A. (2022), Enhanced soot particle ice nucleation ability induced by aggregate compaction and densification. *Atmospheric Chemistry and Physics*. 22 (8): 5331-5364. <https://doi.org/10.5194/acp-22-5331-2022>
9. **Gao K.**, Koch H.-C, Zhou C.-W., & Kanji Z. A. (2022), The dependence of soot particle ice nucleation ability on its volatile content. *Environmental Science: Processes & Impacts*.

<https://doi.org/10.1039/d2em00158f>

10. **Gao K.** & Kanji Z. A. (2022), Impacts of simulated contrail processing and thermal denuding on the ice nucleation of soot particles. *Geophysical Research Letters*. 49(16), e2022GL099869. <https://doi.org/10.1029/2022GL099869>
11. **Gao K.** & Kanji Z. A. (2022), Impacts of cloud processing on ice nucleation of soot particles internally mixed with sulfate and organics. *Journal of Geophysical Research: Atmospheres*. 127(22), e2022JD037146. <https://doi.org/10.1029/2022JD037146>
12. Wu J., Zhao Z., Huang T., Sheng P., Zhang J., Tian H., **Gao K.**, et al. (2017), Removal of elemental mercury by Ce-Mn co-modified activated carbon catalyst. *Catalysis Communications*, 93: 62-66. <http://10.1016/j.catcom.2017.01.016>

Manuscripts accepted for publication

1. **Gao K.**, Vogel F., Foskinis R., Vratolis S., Gini I. M., Granakis K., Zografou O., Fetfatzis P., Berne A., Papayannis A., Möhler O., Eleftheriadis K., Nenes A. (2024), Diurnal cycle of bioaerosols is a key driver of ice nucleating particle variability for Eastern Mediterranean orographic clouds. *npj Climate and Atmospheric Science (In review) Preprints*. <https://doi.org/10.21203/rs.3.rs-4378562/v1> (Accepted on Oct 18, 2024; title changed after revision 'On the drivers of ice nucleating particle diurnal variability in Eastern Mediterranean clouds')

Manuscripts under review

1. **Gao K.** Friebel F., Zhou C.-W., & Kanji Z. A. (2024), Densification effects on the morphology of carbon black aggregates. *Powder Technology*. (In review)

Manuscripts in submission and in preparation

1. **Gao K.**, Foskinis R., Zhang C., Gidarakou M., Violaki K., Brem T. B., Kanji Z. A., Crouzy B., Papayannis A., Nenes A. (2024), Biological particles as predominant ice nucleating particles at an Alpine semi-urban site: abundance, ice nucleation ability and parameterization. (Circulating among coauthors)
2. **Gao K.**, Violaki K., Crouzy B., Papayannis A., Nenes A. (2024), Drivers on the abundance and variability of biological particles at an Alpine semi-urban site. (Writing in progress)
3. Marty N. A., Santiago D. L., **Gao K.**, Konstantinidis T. K., Nenes A. (2024,) Impacts of acidic pH on the ice nucleation activity of bacteria. Aimed for *Atmospheric Chemistry and Physics*. (Waiting for co-authors' comments)

Book chapter

1. Chen, L., **Gao, K.**, Zhang, C., & Lang, W. (2019), Alternative fuels for IC engines and jet engines and comparison of their gaseous and particulate matter emissions, in *Advanced Biofuels: Applications, Technologies and Environmental Sustainability*, edited by K. A. Azad and M. Rasul. pp.18-58, Elsevier Science, Duxford, UK. <https://doi.org/10.1016/B978-0-08-102791-2.00002-7> (First student author)

Conference presentations

1. **Gao, K.**, Zhou, C.-W., Marcolli, C., & Kanji, Z.: Soot particle ice nucleation ability prediction based on soot-PCF framework. *European Aerosol Conference*, UK (2021).
2. **Gao, K.**, Zhou, C.-W., & Kanji, Z.: Enhanced soot particle ice nucleation ability induced by aggregate compaction, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-384, (2021). <https://doi.org/10.5194/egusphere-egu21-384>
3. **Gao, K.**, Zhou, C.-W., Koch, H.-C., & Kanji, Z.: Soot particles ice nucleation ability: dependence on the volatile content. *24th ETH-Conference on Combustion Generated Nanoparticles*, ETH Zurich, Switzerland. (2021). <https://nanoparticles21.scg.ch/program1/tue-june-22-2021>

4. **Gao, K.** & Kanji, Z.: A laboratory study of atmospheric ageing effects on soot particle ice nucleation ability. *American Meteorological Society 102nd Annual Meeting*, Houston, Texas, US, (2022). <https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/393808>
5. Kanji, Z. **Gao, K.**, & Friebel F.: Fluffy or compact? Implications of particle morphology on the ice nucleation of black carbon in the cirrus cloud regime. *American Meteorological Society 102nd Annual Meeting*, Houston, Texas, US, (2022). <https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/400769>
6. Dhaliwal, H., Reynolds, R., Goldstein, H., Kanji, Z., **Gao, K.**, & Ardon-Dryer K.: Effect of coal fly ash and soot particles on human epithelial lung cells. *American Meteorological Society 102nd Annual Meeting*, Houston, Texas, US, (2022). <https://ams.confex.com/ams/102ANNUAL/meetingapp.cgi/Paper/393557>
7. **Gao, K.** & Kanji, Z.: The importance of soot-water contact angle in soot ice nucleation ability in the cirrus regime, EGU General Assembly 2023, Vienna, Austria, 24-28 Apr 2023, EGU23-138, (2023). <https://doi.org/10.5194/egusphere-egu23-138>
8. **Gao, K.**, Foskinis, R., Paraskevi, G., Vratolis, S., Granakis, K., Billault-Roux, A.-C., Vogel, F., Möhler, O., Berne, A., Eleftheriadis, K., Papagiannis, A., and Nenes, A.: Source apportionment and parameterization of ice nucleating particles observed at a high-altitude station in the north-eastern Mediterranean in autumn 2021 during the CALISHTO campaign, EGU General Assembly 2024, Vienna, Austria, 14-19 Apr 2024, EGU24-12784, (2024). <https://doi.org/10.5194/egusphere-egu24-12784>
9. Papayannis, A., Crouzy, B., Foskinis, R., Gidarakou, M., **Gao, K.**, Sikoparija, B., Violaki, K., Tummon, F., Lieberherr, G., Pauling, A., Erb, S., Collaud, M., Gkretsi, S., Clot, B., and Nenes, A.: Lidar and in-situ detection of pollen: Experience from the Pericles campaign, World Aerobiology 2024, 1-5 July 2024, Vilnius, Lithuania, (2024). <https://www.aerobiology2024.com/>
10. Zhang, C., Brem, B., Nowak, N., Modini, R., Crouzy, B., Papayannis, A., Hervo, M., Sikoparija, B., Rosch, M., Gidarakou, M., Foskinis, R., **Gao, K.**, Huglin, C., Nenes, A. Collaud, M., Gysel-Ber, M., Kanji, Z.: Immersion ice-nucleating particle measurement at -30 °C in Payerne, Switzerland: Impact of bioaerosols and wildfire plumes. ACTRIS Science Conference, 13-16 May 2024, Rennes, France, (2024). <https://www.actris.eu/ASC2024>

Awarded patents

1. Chen L., **Gao K.**, et al., 'A centrifugal particle classifier using the particle aerodynamic characteristics', China, CN109985808B[P], 2020. <http://epub.cnipa.gov.cn/patent/CN109985808B>
2. Wu J., **Gao K.**, et al., 'A method for the preparation of gas filtering cotton containing graphene oxide', China, CN106474819A[P], 2017. <http://epub.cnipa.gov.cn/patent/CN106474819A>