

CHRISTOS XENOFONTOS

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PROFILE

Marie Skłodowska–Curie Actions (MSCA) Fellow, Associated CERN Member, and PhD candidate in Atmospheric Sciences with demonstrated expertise in upper-tropospheric aerosol formation, Earth system modelling, and aerosol–cloud interactions. Proven record of first-author publications in high-impact journals (*PNAS*, *Nature* portfolio), extensive international collaborations (CERN, Max Planck Institute for Chemistry), and strong programming, data analysis, and high-performance computing skills. Seeking postdoctoral research positions in atmospheric chemistry, aerosol–cloud–climate interactions, and Earth system modelling.

URL for website: <https://cxenofontos.github.io/>

ORCID identifier: 0009-0004-7637-5199

Google Scholar profile: <https://scholar.google.com/citations?hl=en&user=octjPQYAAAAJ>

EDUCATION

THE CYPRUS INSTITUTE, Nicosia, Cyprus

PhD in Energy, Environment and Atmospheric Sciences

2023 – 2026

Research Project: Anthropogenic NH₃ in the Upper Troposphere: Impacts on Global Particle Formation and the Asian Tropopause Aerosol Layer

UNIVERSITY COLLEGE LONDON, London, England

MSc Planetary Science

2021 – 2022

Degree Classification: Distinction

Research Project: Simulating the performances of ARIEL and JWST in probing the Atmospheres of Planets in the Radius Gap

IMPERIAL COLLEGE LONDON, London, England

MSc Physics

2020 – 2021

Degree Classification: Distinction

Research Project: Inertial Stability and the Behaviour of Tropical Cyclones

IMPERIAL COLLEGE LONDON, London, England

BSc Physics

2017 – 2020

Degree Classification: Upper Second Class Honours

Research Project: Sonoluminescence- Generating Light from acoustically-driven bubbles

RESEARCH ACHIEVEMENTS & PEER RECOGNITION

Achievements Summary

Quantified the global impact of anthropogenic ammonia (NH₃) on upper-tropospheric new particle formation using Earth system modelling constrained by CERN CLOUD chamber measurements. Demonstrated that convectively transported NH₃ enhances aerosol formation via interactions with sulfuric and nitric acids, leading to up to 2.5× increases in cloud-forming particle concentrations and up to 80% increases in aerosol optical depth over high-emission regions. Results advance NH₃-driven particle formation representation in global models and inform climate-relevant assessments.

Publications

1. Christos Xenofontos et al., *Global impact of anthropogenic NH₃ emissions on upper tropospheric aerosol formation*. **Proceedings of the National Academy of Sciences** 122, e2506658122 (2025). doi: <https://doi.org/10.1073/pnas.2506658122>
2. Christos Xenofontos et al., *The impact of ammonia on particle formation in the Asian Tropopause Aerosol Layer*. **npj Climate and Atmospheric Science** 7, 215 (2024). doi: <https://doi.org/10.1038/s41612-024-00758-3>
3. Douglas M. Russell et al., *Isoprene chemistry under upper-tropospheric conditions*. **Nature Communications** 16, 8555 (2025). doi: <https://www.nature.com/articles/s41467-025-64229-w>
4. Nirvan Bhattacharyya et al., *Isoprene aerosol growth in the upper troposphere: Application of the diagonal volatility basis set to cloud chamber measurements*. **ACS ES&T Air** 2, 2092–2104 (2025). doi: <https://doi.org/10.1021/acsestair.5c00106>

5. Jiali Shen et al., *New particle formation from isoprene under upper-tropospheric conditions*. **Nature** 636, 115–123 (2024). doi: <https://doi.org/10.1038/s41586-024-08196-0>

Secondments

1. **CERN CLOUD experiment.** Supported experimental campaigns through night shifts and contributed to planning discussions (Geneva, 2023-2026)
2. **Airmodus Ltd.** Three-week secondment enhancing the Airmodus PSM inversion tool in Python, including improved user-interface clarity, implementation of uncertainty metrics, and advanced data visualization (Helsinki, 2024)
3. **Max Planck Institute for Chemistry.** Two-month collaboration developing the EMAC model setup for simulating atmospheric particle formation and evaluating its climate impact (Mainz, 2023)

Awards and Recognition

1. **Press/Media recognition:** PNAS social media channels, World News (WN), AZoCleantech, and MSN (2025)
2. **Marie Skłodowska Curie Actions (MSCA) CLOUD-DOC Fellowship (EU-2023)**
3. **Ogden Prize:** Awarded annually to **one student** to recognise outstanding achievement in the **Communicating Physics** course. (Imperial College London - 2019)
4. Because of the Ogden Prize, my name was written into the memory of the magnetometer instrument of the Solar Orbiter spacecraft. (Imperial College London - 2019)

Conferences

1. **COMECAp.** Oral presentation on *Impact of Anthropogenic NH₃ on UT Aerosol*, Nicosia, Cyprus (2025)
2. **ICNAA.** Oral presentation on *Impact of Anthropogenic NH₃ on UT Aerosol. Session Chair*, Vienna, Austria (2025)
3. **EGU General Assembly.** Oral presentation on *Anthropogenic NH₃ Impact on UT Aerosol Composition and Climate Forcing*, Vienna, Austria (2025)
4. **EAC.** Oral presentation on the *impact of NH₃ on particle formation in the Asian Tropopause Aerosol Layer*, Tampere, Finland (2024)
5. **EGU General Assembly.** Poster on *Modelling the Impact of NH₃ Emissions on NPF in the Asian Monsoon UT*, Vienna, Austria (2024)

POSITIONS OF RESPONSIBILITY

THE CYPRUS INSTITUTE

Student Representative

Nicosia, Cyprus

2024 – 2026

- Represented student interests at the Graduate School level, participating in academic and institutional decision-making
- Organized student-led events, fostering academic engagement and community-building
- Supported student well-being and productivity through peer outreach and feedback mechanisms

CLOUD COLLABORATION

CLOUD-DOC Student Representative, Paper Committee

CERN, Switzerland

2023 – 2026

- Reviewed and provided scientific feedback on student manuscripts to ensure clarity and consistency
- Coordinated author lists, affiliations, and acknowledgements across CLOUD publications
- Represented doctoral researchers in publication-planning discussions with senior scientists

CHELSEA ACADEMY

Teaching Assistant

London, England

2019

- Delivered weekly physics instruction to secondary-level students over one academic term
- Mentored final-year students achieving gold and silver medals in Physics Olympiads

ADDITIONAL SKILLS

- **Programming & Modelling:** Python, Fortran, SQL, Earth system model development (EMAC), HPC environments, Unix/Linux
- **Software & Tools:** Microsoft Office (Word, Excel, PowerPoint), Git, LaTeX
- **Languages:** Greek (native), English (native), French (IGCSE)
- **Certifications:** Python Programming – Coursera & Python Institute Certified
- **Other:** Experience with large-scale simulations, data analysis, and collaborative research workflows

References available upon request