

CHRISTOS XENOFONTOS

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Date of birth: 2 May 1997 • Place of birth: Nicosia, Cyprus

PROFILE

Post-doctoral Research Fellow at the Cyprus Institute (PACIFIC project). My research focuses on global and regional atmospheric modelling of aviation emissions, with particular emphasis on non-CO₂ climate impacts. I actively participate in CERN CLOUD experiment campaigns, linking controlled experimental results with large-scale atmospheric simulations to improve process-level understanding and model performance. First-author publications in PNAS and Nature portfolio journals, with extensive international collaborations (CERN, Max Planck Institute for Chemistry). Strong programming, data analysis, and high-performance computing expertise. Peer reviewer for various journals, proposals (ERC), and member of the American Chemical Society.

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 (with MSCA Fellowship)

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

PROFESSIONAL EXPERIENCE

THE CYPRUS INSTITUTE, Nicosia, Cyprus

Post-doctoral Research Fellow

2026-Present

Research Project: Particle emissions, Air Quality and Climate Impact related to Fuel Composition and Engine Cycle (PACIFIC)

THE CYPRUS INSTITUTE, Nicosia, Cyprus

Graduate Research Fellow (MSCA Fellow)

2023 – 2026

RESEARCH ACHIEVEMENTS & PEER RECOGNITION

Current Post-doctoral Project

Particle emissions, Air Quality and Climate Impact related to Fuel Composition and Engine Cycle (PACIFIC). I contribute to the integration of global aircraft emission inventories into climate-chemistry models and the simulation of emission scenarios to quantify their impacts on atmospheric composition, aerosols, clouds, and climate forcing. Particular emphasis on non-CO₂ climate impacts.

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>

Review of Proposals

Serve as Remote Referee for European Research Council (ERC) proposals (2026)

Peer Review

Environmental Science & Technology, ES & T: Air, Atmospheric Chemistry and Physics (ACP), *Nature*, AGU journals

Secondments

1. **CERN CLOUD experiment**. Supported experimental campaigns through night shifts and contributed to planning discussions (Geneva, 2023-Present)
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)

Fellowships & Awards

1. **Marie Skłodowska Curie Actions (MSCA) CLOUD-DOC Fellowship** (EU-2023)
2. **Ogden Prize**: Awarded annually to **one student** to recognise outstanding achievement in the **Communicating Physics** course. (Imperial College London - 2019)
3. 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. **CLOUD-DOC Final Conference**. *Oral presentation on Anthropogenic NH₃ in the Upper Troposphere: Impacts on Global Particle Formation and the Asian Tropopause Aerosol Layer*, Frankfurt, Germany (2026)
2. **COMECAP**. *Oral presentation on Impact of Anthropogenic NH₃ on UT Aerosol*, Nicosia, Cyprus (2025)
3. **ICNAA**. *Oral presentation on Impact of Anthropogenic NH₃ on UT Aerosol*. **Session Chair**, Vienna, Austria (2025)
4. **EGU General Assembly**. *Oral presentation on Anthropogenic NH₃ Impact on UT Aerosol Composition and Climate Forcing*, Vienna, Austria (2025)
5. **EAC**. *Oral presentation on the impact of NH₃ on particle formation in the Asian Tropopause Aerosol Layer*, Tampere, Finland (2024)
6. **EGU General Assembly**. *Poster on Modelling the Impact of NH₃ Emissions on NPF in the Asian Monsoon UT*, Vienna, Austria (2024)
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Schools & Workshops

1. Participant at various CERN CLOUD workshops (2023-Present)
2. Participant at the second CLOUD-DOC Summer School in Finland (2024)

3. First CLOUD-DOC Summer School in Frankfurt (2023)
4. EMME-CARE Autumn School on “Analysis of aerosols, air pollution and their sources in the Eastern Mediterranean” in Cyprus (2022)
5. 1st MedCyclones Workshop and Training School at the University of Athens, COST Action CA19109 MedCyclones (2022)

Press/Media recognition

PNAS social media channels, World News (WN), AZoCleantech, and MSN (2025)

POSITIONS OF RESPONSIBILITY

THE CYPRUS INSTITUTE

Nicosia, Cyprus

Student Representative

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

CERN, Switzerland

CLOUD-DOC Student Representative, Paper Committee

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

London, England

Teaching Assistant

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