CHRISTOS XENOFONTOS

Postdoctoral Research Fellow | Atmospheric Science & Climate Modelling

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RESEARCH PROFILE

Atmospheric scientist specializing in Earth system and chemistry-climate modelling, aerosol-cloud interactions, upper-tropospheric particle formation, and aviation non-CO2 climate effects. Currently a Postdoctoral Research Fellow at CARE-C, The Cyprus Institute, contributing to the EU PACIFIC project through integration of global aircraft-emission inventories into climate-chemistry models and simulation of impacts on atmospheric composition, aerosols, clouds, and radiative forcing. Publication record includes first-author papers in PNAS and npj Climate and Atmospheric Science, co-authored papers in Nature and Nature Communications, and active participation in CERN CLOUD experiments.

Research interests: aviation non-CO2 effects; atmospheric aerosols and new particle formation; Earth system modelling; aerosol-cloud-climate interactions; UTLS processes; atmospheric chemistry; emissions inventories; climate forcing.

ACADEMIC APPOINTMENTS & RESEARCH EXPERIENCE

The Cyprus Institute - Climate and Atmosphere Research Center (CARE-C) | Nicosia, Cyprus **2026-present**
Postdoctoral Research Fellow

- PACIFIC project (Particle emissions, Air Quality and Climate Impact related to Fuel Composition and Engine Cycle), coordinated by Airbus.
- Integrate global aircraft-emission inventories into climate-chemistry modelling workflows and simulate aviation impacts on atmospheric composition, aerosols, clouds, and climate forcing.
- Focus on aviation non-CO2 effects and process-level attribution using large-scale global and regional atmospheric simulations.

The Cyprus Institute - CARE-C | Nicosia, Cyprus **2023-2026**
Graduate Research Fellow / MSCA CLOUD-DOC Fellow

- Completed doctoral research on anthropogenic ammonia (NH3) in the upper troposphere using the EMAC Earth system model constrained by CERN CLOUD chamber measurements.
- Quantified effects of anthropogenic NH3 on particle formation, cloud-forming particle concentrations, aerosol optical depth, and climate-relevant processes.
- Conducted international research collaborations with CERN and the Max Planck Institute for Chemistry.

EDUCATION

The Cyprus Institute | Nicosia, Cyprus **2023-2026**
PhD, Energy, Environment and Atmospheric Sciences - Marie Sklodowska-Curie Actions Fellowship — Thesis: Anthropogenic NH3 in the Upper Troposphere: Impacts on Global Particle Formation and the Asian Tropopause Aerosol Layer

- Supervisors: Assoc. Prof. Theodoros Christoudias and Prof. Jos Lelieveld.

University College London | London, UK **2021-2022**
MSc, Planetary Science - Distinction — Research project: Simulating the performances of ARIEL and JWST in probing the atmospheres of planets in the radius gap

- Supervisors: Dr Quentin Changeat and Prof. Ingo Waldmann.

Imperial College London | London, UK **2020-2021**
MSc, Physics - Distinction — Research project: Inertial stability and the behaviour of tropical cyclones

- Supervisor: Prof. Ralf Toumi.

Imperial College London | London, UK **2017-2020**
BSc, Physics - Upper Second-Class Honours — Research project: Sonoluminescence - generating light from acoustically driven bubbles

- Supervisor: Prof. Roland A. Smith.

PEER-REVIEWED PUBLICATIONS

Complete peer-reviewed journal publication list through September 2026. Christos Xenofontos is an author on every item; multi-author collaboration lists are abbreviated.

1. Williamson, C. J., Borrmann, S., Brauner, P., et al., & **Xenofontos, C.** (2026). *Upper troposphere aerosol formation enhanced by monsoon lofted pollution.* **Nature Communications**, published 12 August 2026. doi:10.1038/s41467-026-75073-x [final author]
2. Yu, W., Baalbaki, R., Shen, J., et al. (2026). *Impact of humidity on aerosol growth from methanesulfonic acid.* **Environmental Science: Atmospheres**, online ahead of print. doi:10.1039/d5ea00123d [co-author: C. Xenofontos]
3. Sommer, E., Almeida, J., Yu, W., Simon, M., Moller, F., **Xenofontos, C.**, et al. (2026). *Nucleation of alpha-pinene oxidation products with sulfuric acid.* **Environmental Science: Atmospheres**, 6(8), 1131-1146. doi:10.1039/d6ea00046k
4. **Xenofontos, C.**, et al. (2025). *Global impact of anthropogenic NH3 emissions on upper tropospheric aerosol formation.* **Proceedings of the National Academy of Sciences**, 122(44), e2506658122. doi:10.1073/pnas.2506658122 [first author]
5. Russell, D. M., Kunkler, F., Shen, J., Kohl, M., DeVivo, J., Bhattacharyya, N., **Xenofontos, C.**, et al. (2025). *Isoprene chemistry under upper-tropospheric conditions.* **Nature Communications**, 16, 8555. doi:10.1038/s41467-025-64229-w
6. Bhattacharyya, N., et al. (2025). *Isoprene Aerosol Growth in the Upper Troposphere: Application of the Diagonal Volatility Basis Set to CLOUD Chamber Measurements.* **ACS ES&T Air**, 2(10), 2092-2104. doi:10.1021/acsestair.5c00106 [co-author: C. Xenofontos]
7. Shen, J., et al. (2024). *New particle formation from isoprene under upper-tropospheric conditions.* **Nature**, 636, 115-123. doi:10.1038/s41586-024-08196-0 [co-author: C. Xenofontos]
8. **Xenofontos, C.**, et al. (2024). *The impact of ammonia on particle formation in the Asian Tropopause Aerosol Layer.* **npj Climate and Atmospheric Science**, 7, 215. doi:10.1038/s41612-024-00758-3 [first author]

PREPRINTS & MANUSCRIPTS UNDER REVIEW

1. Ruhl, S., Kohl, M., Baalbaki, R., **Xenofontos, C.**, et al. (2026). *Oxidation mechanisms for volatile methylated sulfur compounds and the major contribution of methanesulfonic acid to Southern Ocean aerosol particles.* **EGUsphere**, preprint under review for Atmospheric Chemistry and Physics. doi:10.5194/egusphere-2026-4020
2. Kohl, M., Bruehl, C., Tost, H., **Xenofontos, C.**, et al. (2026). *Global atmospheric aerosol distributions and composition from the Earth's surface to the stratosphere.* **EGUsphere**, preprint under review for Atmospheric Chemistry and Physics. doi:10.5194/egusphere-2026-3649

RESEARCH CONTRIBUTIONS

- Anthropogenic ammonia and the upper troposphere: combined EMAC simulations with CERN CLOUD-derived mechanisms to quantify how convectively transported NH3 alters new particle formation and aerosol-climate-relevant properties; first-author outputs in PNAS and npj Climate and Atmospheric Science.
- Aviation non-CO2 climate impacts: current postdoctoral work integrates aircraft emission inventories into chemistry-climate modelling and evaluates chemical, aerosol, cloud, and radiative responses.
- CERN CLOUD collaboration: active participation in experimental campaigns and interpretation of chamber results in a global atmospheric modelling framework.

RESEARCH SECONDMENTS & INTERNATIONAL COLLABORATION

CERN - CLOUD Experiment | Geneva, Switzerland **2023-present**
Research secondments / experimental campaigns

- Supported CLOUD experimental campaigns through measurement shifts and scientific planning discussions; contributed to collaborative publications linking chamber measurements and atmospheric modelling.

Airmodus Ltd. | Helsinki, Finland **2024**
Research secondment

- Enhanced the Airmodus Particle Size Magnifier (PSM) inversion tool in Python, improving interface clarity, uncertainty metrics, and data visualization.

Max Planck Institute for Chemistry | Mainz, Germany **2023**
Research collaboration / secondment

- Developed an EMAC model configuration for atmospheric particle formation and climate-impact simulations during a two-month collaboration.

ACADEMIC SERVICE & PEER RECOGNITION

- Remote Referee, European Research Council (ERC) proposals (2026).
- Peer reviewer for Nature; Environmental Science & Technology; ACS ES&T Air; Atmospheric Chemistry and Physics; and AGU journals.
- Session Chair, International Conference on Nucleation and Atmospheric Aerosols (ICNAA), Vienna (2025).
- Member, American Chemical Society (ACS).
- Associated Member, CERN (2023-present).

LEADERSHIP & POSITIONS OF RESPONSIBILITY

The Cyprus Institute | Nicosia, Cyprus **2024-2026**
Student Representative, Graduate School

- Represented student interests in academic and institutional discussions and acted as a liaison between students and faculty.
- Supported student-led activities, community engagement, and feedback on student experience.

CLOUD Collaboration | CERN, Switzerland **2023-2026**
CLOUD-DOC Student Representative, Paper Committee

- Reviewed student manuscript drafts, coordinated author-list and acknowledgement checks, and represented doctoral researchers in publication-planning discussions.

Chelsea Academy | London, UK **2019**
Teaching Assistant - Physics

- Delivered weekly secondary-level physics instruction and mentored final-year students who achieved gold and silver medals in Physics Olympiads.

FELLOWSHIPS, AWARDS & DISTINCTIONS

- Marie Sklodowska-Curie Actions (MSCA) CLOUD-DOC Doctoral Fellowship, European Union (2023-2026).
- Ogden Prize, Imperial College London (2019) - awarded annually to one student for outstanding achievement in Communicating Physics.
- Following the Ogden Prize, name written into the memory of the magnetometer instrument aboard ESA/NASA Solar Orbiter (2019).

SELECTED CONFERENCE PRESENTATIONS

2026 CLOUD-DOC Final Conference, Frankfurt, Germany - Oral: Anthropogenic NH3 in the Upper Troposphere: Impacts on Global Particle Formation and the Asian Tropopause Aerosol Layer.

2025 COMECAP, Nicosia, Cyprus - Oral: Impact of anthropogenic NH3 on upper-tropospheric aerosol.

2025 ICNAA, Vienna, Austria - Oral: Impact of anthropogenic NH3 on upper-tropospheric aerosol; Session Chair.

2025 EGU General Assembly, Vienna, Austria - Oral: Anthropogenic NH3 impact on upper-tropospheric aerosol composition and climate forcing.

2024 European Aerosol Conference (EAC), Tampere, Finland - Oral: Impact of NH3 on particle formation in the Asian Tropopause Aerosol Layer.

2024 EGU General Assembly, Vienna, Austria - Poster: Modelling the impact of NH3 emissions on new particle formation in the Asian monsoon upper troposphere.

SELECTED SCHOOLS & WORKSHOPS

- CERN CLOUD collaboration workshops (2023-present).
- CLOUD-DOC Summer School, Finland (2024).
- CLOUD-DOC Summer School, Frankfurt, Germany (2023).
- EMME-CARE Autumn School: Analysis of aerosols, air pollution and their sources in the Eastern Mediterranean (Cyprus, 2022).
- 1st MedCyclones Workshop and Training School, COST Action CA19109, University of Athens (2022).

SCIENCE COMMUNICATION & MEDIA

Politis, 9 March 2026 - Η πραγματικότητα για την κλιματική κρίση μέσα από την δουλειά τριών Κυπριών φοιτητών - feature on three Cyprus Institute doctoral research projects, including Xenofontos' work on anthropogenic NH3, upper-tropospheric particle formation, CERN CLOUD measurements, and the PNAS study.

- Additional coverage/recognition through PNAS News, ANT1 Live, Phileleftheros, Cyprus News Agency, AZoCleanTech, MSN, EMME-CARE, and institutional research channels.

TECHNICAL SKILLS

Atmospheric modelling: EMAC (ECHAM/MESSy), Earth system and chemistry-climate modelling, aerosol microphysics, emissions integration, climate-forcing diagnostics.

Programming & computing: Python, Fortran, SQL, Unix/Linux, Git, HPC environments, LaTeX.

Data analysis: Large-scale simulation analysis, scientific visualization, uncertainty/error analysis, collaborative research workflows.

Languages: Greek (native), English (native), French (IGCSE).

Certification: Python programming - Coursera / Python Institute certification.