

# CHRISTOS XENOFONTOS

CARE-C, The Cyprus Institute, 1645 Nicosia, Cyprus • [c.xenofontos@cyi.ac.cy](mailto:c.xenofontos@cyi.ac.cy)

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

## PROFILE

Marie Skłodowska–Curie Actions (MSCA) Fellow and Associated CERN Member with a PhD in Energy, Environment and Atmospheric Sciences, specializing in upper-tropospheric aerosol formation, Earth system modelling, and aerosol–cloud interactions. 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. Reviewer for Environmental Science & Technology 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 NH<sub>3</sub> 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 (NH<sub>3</sub>) on upper-tropospheric new particle formation using Earth system modelling constrained by CERN CLOUD chamber measurements. Demonstrated that convectively transported NH<sub>3</sub> 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 NH<sub>3</sub>-driven particle formation representation in global models and inform climate-relevant assessments.

### Publications

1. **Christos Xenofontos** et al., *Global impact of anthropogenic NH<sub>3</sub> 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 NH<sub>3</sub> on UT Aerosol*, Nicosia, Cyprus (2025)
2. **ICNAA**. *Oral presentation on Impact of Anthropogenic NH<sub>3</sub> on UT Aerosol*. **Session Chair**, Vienna, Austria (2025)
3. **EGU General Assembly**. *Oral presentation on Anthropogenic NH<sub>3</sub> Impact on UT Aerosol Composition and Climate Forcing*, Vienna, Austria (2025)
4. **EAC**. *Oral presentation on the impact of NH<sub>3</sub> on particle formation in the Asian Tropopause Aerosol Layer*, Tampere, Finland (2024)
5. **EGU General Assembly**. *Poster on Modelling the Impact of NH<sub>3</sub> Emissions on NPF in the Asian Monsoon UT*, Vienna, Austria (2024)

## POSITIONS OF RESPONSIBILITY

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### THE CYPRUS INSTITUTE

Nicosia, Cyprus  
2024 – 2026

#### *Student Representative*

- 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  
2023 – 2026

#### *CLOUD-DOC Student Representative, Paper Committee*

- 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  
2019

#### *Teaching Assistant*

- 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

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- **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*