CHRISTOS XENOFONTOS

CARE-C, The Cyprus Institute, 1645 Nicosia, Cyprus • + 357 99768524 • c.xenofontos@cyi.ac.cy

PROFILE

Marie Skłodowska–Curie Actions Fellow (MSCA) and Ph.D. candidate in Atmospheric Sciences at The Cyprus Institute. My research investigates how anthropogenic ammonia (NH_3) emissions influence upper-tropospheric aerosol formation and climate. I use the EMAC Earth system model, integrating mechanisms from the CLOUD experiment at CERN. Secondments at the Max Planck Institute for Chemistry and CERN (CLOUD experiment). Published in high-impact journals including *PNAS* and *Nature*, and reviewed manuscripts for *Environmental Science & Technology*.

EDUCATION

THE CYPRUS INSTITUTE, Nicosia, Cyprus
PhD in Energy, Environment and Atmospheric Sciences *2023 – 2026*
Research Project: Anthropogenic NH_3 in the Upper Troposphere: Global Impact on Particle Formation and Its Role in 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

THE ENGLISH SCHOOL, NICOSIA, Nicosia, Cyprus
High School Diploma *2010 - 2016*
A Levels: Physics (A*), Mathematics (A*), Further Mathematics (A*), Biology (A), Modern Greek (A)

RESEARCH ACHIEVEMENTS & PEER RECOGNITION

Achievements Summary

I quantify the global impact of anthropogenic NH_3 on new particle formation (NPF) in the upper troposphere, where aerosols shape cloud properties and climate. Using Earth system modeling and CLOUD-derived NPF mechanisms, I show that NH_3—transported by convection from agricultural sources—enhances aerosol formation through interactions with sulfuric and nitric acids. Simulations reveal that anthropogenic NH_3 increases cloud-forming particle concentrations by up to 2.5× over high-emission regions and raises aerosol optical depth by as much as 80%, amplifying climate effects. This work advances NH_3-driven NPF representation in global models, improving climate projections and informing policy.

Publications

1. Xenofontos, Christos, et al. "Global impact of anthropogenic NH_3 emissions on upper tropospheric aerosol formation." *Proceedings of the National Academy of Sciences* 122.44 (2025): e2506658122.

2. Xenofontos, Christos, et al. "The impact of ammonia on particle formation in the Asian Tropopause Aerosol Layer." *npj climate and atmospheric science* 7.1 (2024): 215.

3. Russell, Douglas M., et al. "Isoprene chemistry under upper-tropospheric conditions." *Nature Communications* 16.1 (2025): 8555.

4. Bhattacharyya, Nirvan, et al. "Isoprene Aerosol Growth in the Upper Troposphere: Application of the Diagonal Volatility Basis set to Cloud Chamber Measurements." *ACS ES & T Air* 2.10 (2025): 2092-2104.

5. Shen, Jiali, et al. "New particle formation from isoprene under upper-tropospheric conditions." *Nature* 636.8041 (2024): 115-123.

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 to enhance the Airmodus PSM inversion tool in Python, improving user interface legibility, adding error metrics, and refining 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. My PNAS publication received broad media recognition, including release and promotion through **official PNAS channels**, as well as significant engagement across platforms such as **Twitter, LinkedIn, and Bluesky** (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_3 on UT Aerosol*, Nicosia, Cyprus (2025)
2. **ICNAA**. *Oral presentation on Impact of Anthropogenic NH_3 on UT Aerosol*, Vienna, Austria (2025)
3. **EGU General Assembly**. *Oral presentation on Anthropogenic NH_3 Impact on UT Aerosol Composition and Climate Forcing*, Vienna, Austria (2025)
4. **EAC**. *Oral presentation on the impact of NH_3 on particle formation in the Asian Tropopause Aerosol Layer*, Tampere, Finland (2024)
5. **EGU General Assembly**. *Poster on Modelling the Impact of NH_3 Emissions on NPF in the Asian Monsoon UT*, Vienna, Austria (2024)

POSITION 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
- Acted as liaison between students and faculty, ensuring transparent communication and leadership representation

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

- Reviewed and provided feedback on student paper drafts to uphold scientific clarity
- Ensured accuracy of author lists, affiliations, and acknowledgements across CLOUD publications
- Represented doctoral students in discussions with senior researchers on publication planning and policy

ADDITIONAL SKILLS

- **Languages:** Greek (native), English (native), French (IGCSE)
- **Programming & Modelling:** Python, Fortran, Earth system model development (EMAC), HPC environments, Unix/Linux
- **Software & Tools:** Microsoft Office (Word, Excel, PowerPoint), Git, LaTeX
- **Certifications:** Python Programming – Coursera & Python Institute Certified
- **Teaching:** Guided final year physics students to win gold and silver medals in Physics Olympiads (Chelsea Academy, London)
- **Other:** Experience with large-scale simulations, data analysis, and collaborative research workflows

WEBSITES

- **Personal Website:** https://cxenofontos.github.io/
- **ORCID:** https://orcid.org/0009-0004-7637-5199
- **ResearchGate:** https://www.researchgate.net/profile/Christos-Xenofontos-3
- **Google Scholar:** https://scholar.google.com/citations?hl=en&user=octjPQYAAAAJ

References available upon request