May Chim

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EDUCATION

2021-2024 **PhD in Chemistry,** University of Cambridge

2016-2018 **MPhil in Earth and Atmospheric Science**, The Chinese University of Hong Kong (GPA: 3.9/4.0)

2012-2016 **BSc in Earth System Science**, The Chinese University of Hong Kong (First Class Honour)

RESEARCH EXPERIENCE

2025-Present **Croucher Postdoctoral Research Fellow**
Department of Mathematics and Statistics, University of Exeter
Supervisor: Prof. Jim Haywood

- Developing an innovative interdisciplinary modelling framework that integrates Earth System Model with global crop models to quantify how large explosive volcanic eruptions affect agricultural productivity and food security worldwide
- Serving as team lead for the Fresh Eyes on CMIP volcanic forcing subgroup, directing the evaluation of the historical and future volcanic forcing datasets to support the Coupled Model Intercomparison Project (CMIP7), which forms the scientific basis of the Intergovernmental Panel on Climate Change (IPCC) reports.

2021-2024 **PhD in Chemistry**
Centre for Atmospheric Science, University of Cambridge
Project: Climate impacts of volcanic eruptions
Supervisors: Prof. Anja Schmidt, Prof. Thomas J. Aubry, Dr. Nathan Luke Abraham

- Developed UKESM-VPLUME, a novel modelling framework coupling a one-dimensional volcanic plume model with the UK Earth System Model, securing computing resources for over 5000 model years of climate simulations
- Results revealed three key findings that challenge current understanding in climate science:
  - Current climate projection studies very likely (>95% chance) underestimate future volcanic forcing and its climate effects,
  - Future volcanic forcing can contribute up to 49% of climate uncertainty, and
  - Future volcanic eruptions may delay Antarctic ozone hole recovery.
- These findings challenge current climate projection methodologies and have implications for global climate policy assessments

2016-2018 **MPhil in Earth and Atmospheric Science**
Division of Earth and Atmospheric Science, The Chinese University of Hong Kong
Project: The role of water in heterogeneous oxidation of atmospheric organic aerosols
Supervisor: Prof. ManNin Chan

- Developed an integrated modelling approach combining aerosol oxidation and thermodynamic models to simulate how aerosols change their chemical composition and water content during oxidation processes.
- Simulation results revealed that water content in organic aerosols affects atmospheric oxidation processes through physical mechanisms (changes in diffusivity) rather than chemical pathways.
- These findings improve understanding of aerosol chemistry and microphysics processes, with implications for atmospheric models simulating organic aerosol behaviour.

2012-2016 **Bachelor thesis**
Earth System Science Programme, The Chinese University of Hong Kong
Project: Exhumation history of the North China Craton
Supervisor: Prof. Jason Zhang

- Investigated the exhumation history of the North China Craton using geochemical and petrological approaches, including electron probe microanalysis, petrographic microscopy, and geothermobarometry
- Results demonstrated that amphibolite (metamorphic rock) samples formed at 27km depth in the middle crust before being exhumed to the surface, supporting continental-continental collision theory for the region

SCHOLARSHIPS AND AWARDS

2024	Croucher Postdoctoral Fellowship (2-year independent research fellowship)
2024	STEM for Britain (UK early career scientist research poster competition), Finalist
2023	American Geophysical Union Outstanding Student Presentation Award (Oral)
2023	Chemistry Showcase Week Best Talk Runner-up, University of Cambridge
2023	Joseph Needham Merit Scholarship (4th year PhD funding at Cambridge)
2023	Bob Hunter Prize, Honourable Mentions (Runner-up for best student oral presentation in VMSG)
2021	American Geophysical Union Outstanding Student Presentation Award (Poster)
2021	Croucher Cambridge International Scholarship (PhD funding at Cambridge)
2018	Award of Outstanding Service at CUHK Earth System Science Programme
2016	Geological Society of Hong Kong Best Undergraduate Research Prize
2014 & 2016	Dean's Honour List, Chinese University of Hong Kong
2015	Dean's Honour List, University of California, Irvine
2014	Chung Chi College Head's List and Class Scholarship (First of Class of 2014)

PUBLICATION LIST

(Google scholar; h-index: 8; Citations: 235)

11. **Chim, M. M. et al.** Future volcanic eruptions may delay the recovery of lower stratospheric ozone over Antarctica and Southern Hemisphere mid-latitudes, in prep.
10. **Chim, M. M.**, Aubry, T. J., Smith, C., & Schmidt, A. (2025). Neglecting future sporadic volcanic eruptions underestimates climate uncertainty. *Commun Earth Environ* **6**, 236 (2025). [**Invited guest post** on Carbon Brief].
9. **Chim, M. M.**, Maters, E. C., Morin, J., Kavanagh, J. L., Donovan, A., Aubry, T. J., & Schmidt, A. (2023). Disproportionate impacts of the COVID-19 pandemic on early career researchers and disabled researchers in volcanology. Frontiers in Earth Science, 11.
8. **Chim, M. M.**, Aubry, T. J., Abraham, N. L., Marshall, L., Mulcahy, J., Walton, J., and Schmidt, A. (2023). Climate projections very likely underestimate future volcanic forcing and its climatic effects. Geophysical Research Letters, *50*(12), e2023GL103743. [**Press release**] (**selected as AGU Eos Research Spotlight**)
7. Sun, H. Z., Zhao, J., Liu, X., Qiu, M., Shen, H., Guillas, S., Giorio, C., Staniaszek, Z., Yu, P., Wan, M. W. L., **Chim., M. M.**, … & Archibald, A. T. (2023). Antagonism between ambient ozone increase and urbanization-oriented population migration on Chinese cardiopulmonary mortality. The Innovation, 4(6).
6. UNEP (2019). Waste-to-Energy: Considerations for Informed Decision-Making. ISBN: 978-92-807-3754-7. Lead author: **Chim, M. M.** [**Press release**]
5. **Chim, M. M.**, Lim, C. Y., Kroll, J. H., and Chan, M. N. (2018). Evolution in the Reactivity of Citric Acid toward Heterogeneous Oxidation by Gas-Phase OH Radicals. ACS Earth and Space Chemistry, 2(12), 1323-1329.
4. Kwong, K. C., **Chim, M. M.**, Hoffmann, E. H., Tilgner, A., Herrmann, H., Davies, J. F., Wilson, K. R., and Chan, M. N. (2018). Chemical Transformation of Methanesulfonic Acid and Sodium Methanesulfonate through Heterogeneous OH Oxidation. ACS Earth and Space Chemistry, 2(9), 895-903.
3. Kwong, K. C., **Chim, M. M.**, Davies, J. F., Wilson, K. R., & Chan, M. N. (2018). Importance of Sulfate Radical Anion Formation and Chemistry in Heterogeneous OH Oxidation of Sodium Methyl Sulfate, the Smallest Organosulfate. Atmospheric Chemistry and Physics, 18(4), 2809-2820.
2. **Chim, M. M.**, Cheng, C. T., Davies, J. F., Berkemeier, T., Shiraiwa, M., Zuend, A., and Chan, M. N. (2017). Compositional Evolution of Particle Phase Reaction Products and Water in the Heterogeneous OH Oxidation of Aqueous Organic Droplets. Atmospheric Chemistry and Physics, 17, 14415-14431.
1. **Chim, M. M.**, Chow, C. Y., Davies, J. F. and Chan, M. N. (2017). Effects of Relative Humidity and Particle Phase Water on the Heterogeneous OH Oxidation of 2-Methylglutaric Acid Aqueous Droplets. The Journal of Physical Chemistry A, 121(8), 1666-1674.

ACADEMIC SERVICES

2023-Present	**Team lead**, Volcanic Forcing Subgroup, Fresh Eyes on CMIP Modern Forcings Project
2025	**Co-convenor**, "Interactions between Volcanic Eruptions and Climate", IAVCEI 2025
2023	**Co-convenor**, "Interactions between Volcanic Eruptions and Climate", IAVCEI 2023
2019-2021	**Young Fellow Sub-committee**, Geological Society of London, Hong Kong Regional Group

TEACHING EXPERIENCE

2024	**Supervisor**, Part III Atmospheric Chemistry and Global Change (University of Cambridge)
2023	**Course leader**, Volcanoes and Climate Dynamics (one-week short course; CUHK)
2022	**Demonstrator**, UKCA Training Course (National Centre of Atmospheric Science)
2018	**Teaching Assistant** for Atmospheric Chemistry (CUHK) **Teaching Assistant** for Geoscience field study course to Taiwan (CUHK)
2017	**Supervisor** for four undergraduate students' summer research projects (CUHK)
2016	**Teaching Assistant** for Petrology (CUHK) **Teaching Assistant** for Geoscience field study course to Taiwan (CUHK)

OUTREACH EXPERIENCE

2023-2024	**Climate-Volcano Science Outreach Project (£9k)** - funded by the Croucher Foundation to organise outreach activities to promote climate-volcano science in Hong Kong.
2022-2024	**Museum Volunteer**, Scott Polar Museum, Cambridge
2023	**Volcano Outreach Day** at London's Natural History Museum (one-day event)

PROFESSIONAL WORK EXPERIENCE

2019-2020	**Assistant Environmental Protection Officer** (full-time), Environmental Protection Department, the Government of the HKSAR
2019	**Experimental Officer** (full-time), Hong Kong Observatory, the Government of the HKSAR
2018-2019	**Environmental Affairs Intern** (full-time), United Nations Environment Programme International Environmental Technology Centre (UNEP-IETC), Osaka, Japan

SELECTED TALKS

- Volcano2Fork: Mapping global food and nutrition impacts from volcanic eruption, Cambridge, UK (**Invited talk**)
- IAVCEI Scientific Assembly 2025, Geneva, Switzerland (**Invited talk**)
- Invited seminar, Weather and Climate Risk Group, ETH Zurich, Switzerland (**Invited talk**)
- European Geophysical Union General Assembly 2025, Vienna, Austria (**Invited talk, keynote speaker**)
- Cambridge Centre for Climate Science (CCfCS) Winter Symposium 2024, Cambridge, UK (Oral)
- CMIP Online Seminar Series 2024 (**Invited talk**)
- European Space Agency (ESA) Ozone CCI User Workshop 2024 (Oral)
- European Geophysical Union General Assembly 2024, Vienna, Austria (**Oral, Highlight talk**)
- Volcanic and Magmatic Studies Group Meeting 2023, Bristol, UK (Oral)
- American Geophysical Union Fall Meeting 2023, San Francisco (Oral)
- Research visit at German Aerospace Centre (DLR), Munich, Germany, 2023 (**Invited talk**)
- Research visit at United Kingdom Met Office, Exeter, UK, 2023 (**Invited talk**)
- IAVCEI Scientific Assembly 2023, New Zealand (Oral)
- Volcanic and Magmatic Studies Group Meeting 2023, London, UK (Oral)
- European Geophysical Union General Assembly 2022, Vienna, Austria (Oral)

REFEREES

Prof. Anja Schmidt (PhD supervisor)	German Aerospace Centre (DLR), Munich, Germany Email: anja.schmidt@dlr.de
Prof. Thomas Aubry (PhD supervisor)	Department of Earth Sciences, University of Oxford, Oxford, UK Email: thomas.aubry@earth.ox.ac.uk