Maureen Cohen

• *PhD Candidate in Atmospheric & Environmental Sciences* • *Science writer & translator* • *Consultant*
s1144983@ed.ac.uk // maureenjcohen@gmail.com // https://mj-cohen.com

Who

I am a PhD candidate at the University of Edinburgh in Atmospheric and Environmental Sciences. My research focuses on the atmospheric dynamics of tidally-locked Earth-like exoplanets. I use numerical climate models of varying complexity and simple analytical equations to understand the physics of planets with a similar size and composition to Earth, but radically different orbital configurations and radiative forcing. My model studies seek to aid interpretation of astronomical observations of exoplanets and to deepen our understanding of the physics of planetary atmospheres.

I also work with Six Degrees Edinburgh, a student think tank, as a sustainability consultant helping small businesses reduce their carbon footprint. I am a member of the Gateway Earth Development Group, an informal think tank advocating for a modular and sustainable space access infrastructure. I freelance as a science writer and translator and write a regular blog about my research and other work. Finally, I volunteer with the non-profit organisations Empty Kitchens Full Hearts and Lothian Conservation Volunteers on issues of food waste, poverty, environmentalism, and conservation.

Publications

2021: "A Diffusion-based Algorithm for Removing Background Stars from Astronomical Images," **Astronomy & Computing**. 100507. Lead author.

2019: "Is the Deep Space Gateway in the Right Place?" **70th International Astronautical Congress (IAC)**, Washington, D.C., United States, 21-25 October 2019. Co-author.

2018: "Putting the Propellant in the Fuel Tank: Developing the Technical and Operational Framework for Gateway Earth Space Access Infrastructure," **Journal of the British Interplanetary Society**, Vol. 71. Co-author.

Research

2020-2024, PhD title: "Variability in atmospheres of tidally-locked exoplanets" (University of Edinburgh)

- *Chapter 1: Stratospheric wind oscillations on a tidally-locked exoplanet: A QBO analogue on Proxima Centauri b*
- *Chapter 2: Periodic water cloud cover variations on a tidally-locked exoplanet: How atmospheric feedbacks cause variability in equilibrium climate models and impact exoplanet observations*
- *Chapter 3: Climate stability and the hydrological cycle on a tidally-locked exoplanet*

2019-2020, MPhys project title: "Applications of the diffusion equation to image processing" (Heriot-Watt University)

- *Designed a software algorithm based on Perona-Malik diffusion that "denoises" astronomical images by removing background stars*

2019 summer project: "Space Traffic Control: Monitoring Low Earth Orbit" (Institute for Astronomy, University of Edinburgh)

- *Wrote a software program that automatically detects satellite streaks in digital images and extracts orbital data for satellite identification*

2017 summer project: "On-orbit satellite servicing from geostationary orbit: economic feasibility study" (Institute for Astronomy, University of Edinburgh)

- *Economic analysis of a future market for on-orbit satellite repairs carried out from geostationary orbit*

Education

| 2015 - 2020 | MPhys in Mathematical Physics, Heriot-Watt University
First Class

| 2011 - 2012 | MSc in Mediterranean Archaeology, University of Edinburgh
Distinction

| 2004 - 2008 | BA in Classical Civilization, University of California at Berkeley
Distinction

Funding

PhD funder 2020-2024: National Environmental Research Council (grant no. NE/S007407/1)
Summer 2019: Athena Swan Summer Bursary
Summer 2019: Carnegie Trust Vacation Scholarship

Conferences

2022: Chartered Institute of Linguists Conference 2022, London, UK
Presentation: *"What is expertise? Translating science as a scientist"*
Panel discussion: *"What next? Strategies for mid- and late career translators"*
2021: American Geophysical Union Fall Meeting, New Orleans, USA
Presentation: *"Dynamics of a QBO-like phenomenon on a tidally locked planet"*
2021: Scottish Exoplanet and Brown Dwarf Meeting, spring 2021
Presentation: *"Variability in atmospheres of tidally-locked M-dwarf planets"*
2017: Reinventing Space Conference, Strathclyde University
Poster Presentation: *"Putting the Propellant in the Fuel-Tank": Developing the Technical and Operational Framework for Gateway Earth Space Access Architecture*
2013: Frontiers of the European Iron Age Conference, University of Cambridge
Paper Presentation: *Visual Imagery in Iron Age Italy: A Contextual Study of Villanovan Bronze Belts*

Professional activities

Freelance translator and editor, German to English. I am a Chartered Linguist and Member of the Chartered Institute of Linguists. I work on legal and scientific translations for direct clients and translation agencies.

Freelance science writer. I write science articles for Futurum Careers, an online educational resource and magazine for young people interested in careers in STEM.

Consulting

Six Degrees Edinburgh: Consultant & Project Lead

- *Alliance to Feed the Earth in Disasters (ALLFED)*: Risk assessment of emerging second-order biotic threats to breadbasket regions due to climate change (project lead)
- *Brockholes farm*: Achieving net zero emissions for farm operations (consultant)
- *Scotland the Bread*: A low-carbon, low-cost flour distribution strategy for small-scale consumers/customers (consultant)

Edinburgh Centre for Carbon Innovation: Consultant

Yaldi Games: Using a video game to encourage player engagement with environmental issues

Gateway Earth Development Group: Programme Director for Market Analysis.

- "Geostationary space station: necessary next step for the space ecosystem" (white paper). Business case & science function.
- "Is the Deep Space Gateway in the right place?" Literature review.
- "Putting the Propellant in the Fuel Tank: Developing the Technical and Operational Framework for Gateway Earth Space Access Infrastructure." Economic feasibility analysis.

Skills

Programming: Python, some Matlab
Languages: Fluent German, competent French and Italian
Cross-disciplinary knowledge, thinking, and interests
Independent and motivated
Excellent writing and communication skills

Memberships

Six Degrees Edinburgh student think tank
Gateway Earth Development Group independent think tank
Chartered Institute of Linguists, Member and Chartered Linguist
Lothian Conservation Volunteers
Empty Kitchens, Full Hearts

Past qualifications

2014-2015: Level 7 Diploma in Translation, Chartered Institute of Linguists
2014-2016: Level 4 Diploma in Paralegal Studies, National Association of Licensed Paralegals
2005: Certificate of Proficiency in French, McGill University

Hobbies

Passionate rock climber! + hiking, backpacking