CLAIRE MARIE GUIMOND

email cmg76@cam.ac.uk
post University of Cambridge, Bullard Labs, Madingley Rise, Cambridge, CB3 0EZ
website clairesworld.github.io
twitter @xo_planets

Qualifications

Doctor of Philosophy in Earth Sciences (expected 2023)
University of Cambridge, Cambridge, UK (2019–)

- *supervisors:* Dr. Oliver Shorttle & Dr. John Rudge
- *thesis title:* Predictions on exoplanet surfaces from deep in the Earth

Master of Science in Earth & Planetary Science
McGill University, Montréal, CA (2016–2018)

- *supervisor:* Dr. Nicolas Cowan
- *cGPA: 4.0* (out of 4.0)
- *thesis title:* The direct imaging search for Earth 2.0

Bachelor of Science, Honours in Earth System Science
with Minor Concentration English Literature
McGill University, Montréal, CA (2011–2015)

- *supervisor:* Dr. Boswell Wing
- *cGPA:* 3.7 (out of 4.0)
- *major GPA:* 3.9
- *thesis title:* Controls on sulfur isotope fractionation in deep sea pore water

Internships

Research Internship
Department of Geochemistry, Freie Universität Berlin, DE (2019)

- Led and managed research project in geodynamics, focusing on numerical modelling of the coupled thermo-chemical evolution of the early Earth's mantle and atmosphere, with Dr. Lena Noack. In collaboration with Dr. Frank Sohl (German Aerospace Centre).

Research Assistant
Department of Physics, McGill University, Montréal, CA (2018)

- Led and managed research project in exoplanet science, focusing on numerical modelling of space telescope observations, under the advising of Dr. Nicolas Cowan.

Research Assistant
Department of Natural Resource Sciences, McGill University, Montréal, CA (2015)

- Member of research team headed by Dr. Ian Strachan. Obtained field samples in wetland sites, performed lab gas chromatography analysis. Engineered novel instrumentation for sample collection.

Research Student
Department of Cardiovascular Surgery, Hospital for Sick Children, Toronto, CA (2013, 2014)

- Member of clinical research team. Worked with Dr. Glen Van Arsdell (Chair of the Division of Cardiac Surgery at the University of Toronto). Responsible for data collection in several clinical research studies, focusing on congenital heart disease surgical outcomes. Conducted reviews of the literature.

Research publications

Peer-reviewed

Guimond, C. M., Rudge, John F., and Shorttle, O. (2022). Blue marble, stagnant lid: Could dynamic topography avert a waterworld? *The Planetary Science Journal*, 3, 66.

Guimond, C. M., Noack, L., Ortenzi, G., and Sohl, F. (2021). Low volcanic outgassing rates for a stagnant lid Archean earth with graphite-saturated magmas. *Physics of the Earth and Planetary Interiors*, 320.

Ortenzi, G., Noack, L., Sohl, F., **Guimond, C. M.**, Grenfell, J. L., Dorn, C., Schmidt, J. S., Vulpius, S., Katyal, N., Kitzmann, D., & Rauer, H. (2020). Mantle redox state drives outgassing chemistry and atmospheric composition of rocky planets. *Scientific Reports*, 10.

Guimond, C. M. & Cowan, N. B. (2019). Three direct imaging epochs could constrain the orbit of Earth 2.0 inside the habitable zone. *The Astronomical Journal*, 157, 5.

Guimond, C. M. & Cowan, N. B. (2018). The direct imaging search for Earth 2.0: Quantifying biases and planetary false positives. *The Astronomical Journal*, 155, 230.

Conference proceedings

Guimond, C. M., Shorttle, O., & Rudge, J. F. (2020). Does topography matter for rocky exoplanets? Europlanet Science Congress, abstract id. EPSC2020-914

Noack, L., Ortenzi, G., **Guimond, C. M.**, Dorn, C. & Sohl, F. (2019). Degassing chemistry variation on rocky exoplanets. Europlanet Science Congress-DPS Joint Meeting, abstract id. EPSC-DPS2019-2003

Noack, L., **Guimond, C. M.**, Ortenzi, G., & Sohl, F. (2019). Modelling rocky planets from mantle to atmosphere: predictions from Earth to exoplanets. American Geophysical Union, Fall Meeting, abstract id. P51G-3441.

Sohl, F., Ortenzi, G., Noack, L., **Guimond, C. M.**, Schmidt, J. & Vulpius, S. (2019). How magmatic degassing of C, O, and H affects Earth's early atmosphere. Extreme Solar Systems 4, id. 321.03. Bulletin of the American Astronomical Society, Vol. 51, No. 6

Guimond, C. M. & Cowan, N. B. (2019). Determining orbits of directly imaged exoplanets within the habitable zone. American Astronomical Society, AAS Meeting, abstract id. 402.07

Halevy, I., Wing, B. A., Wenk, C., & **Guimond, C. M.** (2015). Sedimentary environments and preservation biases limit sulfur isotope fractionation observed in pyrite, despite large microbial fractionations. American Geophysical Union, Fall Meeting, abstract id. B24A-08

Technical documents

HabEx team, 200+ contributors including **Guimond, C. M.** (2019). The Habitable Exoplanet Observatory Final Report. Technical document prepared for NASA.

LUVOIR team, 200+ contributors including **Guimond, C. M.** (2018). The LUVOIR Mission Concept Study Interim Report. Technical document prepared for NASA.

Invited seminars

2022

- "The topographic scope for land atop a stagnant lid"
  Institute for Theoretical Geophysics Seminars, University of Cambridge, UK

2021

- "Scaling exoplanet topography"
  Harding Scholarship Welcome Event, University of Cambridge, UK [virtual]

2019
- "Direct imaging of habitable zone planets"
  Max Planck Institute for Solar System Research, Göttingen, DE
- "The origin of Earth's secondary atmosphere"
  Freie Universität Berlin, Berlin, DE

Selected presentations (oral and poster)

2022
- "Limits to land planets, and how to store oceans on or inside them"
  Rocky Worlds 2 meeting, University of Oxford, UK [poster]
- "Land planets, water planets, and the topography that makes them"
  Doctoral Training Partnership Symposium, Natural History Museum, London, UK [oral]
- "Could dynamic topography avert a waterworld?"
  Initiative for Planetary Science and Life in the Universe meeting, University of Cambridge, UK [oral]
- "Water planet thresholds: The topographic scope for land atop a stagnant lid"
  European Geoscience Union General Assembly, Vienna, AT [oral]
- "Water planet thresholds: The topographic scope for land atop a stagnant lid"
  Origins Seminar, University of Arizona, US [oral; virtual]

2021
- "Islands in a black sky: Towards scaling relationships for dynamic topography and land propensity on rocky planets"
  UK Exoplanet Meeting, Unversity of Birmingham, UK [oral; virtual]

2020
- "Does topography matter for rocky planets?"
  Exoplanets III, University of Heidelberg, DE [poster; virtual]

2019
- "How well can we image Earth-sized planets?"
  Rencontres exobiologiques pour doctorants, Le Teich, FR [oral]

2018
- "The Large UV-Optical-IR Surveyor"
  Future of Space Astronomy in Canada, Montréal, CA [oral]
- "Finding Earth 2: Blue dot or red herring?"
  Astrophysical Frontiers in the Next Decade and Beyond, Portland, US [oral]
- "Biases and planetary false positives in the search for Earth twins"
  Canadian Astronomical Society Annual Meeting, Victoria, CA [poster]

2017
- "Biases and planetary false positives in the search for Earth twins"
  Exoclipse conference, Boise ID, US [oral]
- "Looking for Earth twins on the back of an envelope"
  CRAQ annual meeting, Saint-Alexis, CA [oral]

Teaching expertise

Demonstrator, Department of Earth Sciences, University of Cambridge, UK (2019–)
- Tutor lab practical sessions: demonstrate mapping techniques, microscope use, sample inquiry, theoretical problem solving
- Courses/modules: Part 1A Earth Science laboratory, Part 1A geological field trip, Part 2 Geophysics (all undergraduate)

Teaching Assistant, Department of Earth & Planetary Sciences, McGill University, Montréal, CA (2016–2018)

- Grade assignments, tutor lab practical sessions: using computer software and code, theoretical problem solving
- Courses/modules: various Earth Sciences courses, second-to-fourth year undergraduate

Selected awards and scholarships

2019/2020

- Harding Distinguished Postgraduate Research Scholarship, Cambridge Trust
- Alexander Graham Bell Canada Graduate Scholarship - Doctoral, Natural Sciences and Engineering Research Council of Canada (NSERC), declined
- Postgraduate Scholarship - Doctoral, NSERC
- EPSC Conference Bursary, Europlanet Society

2017/2018

- Carl Reinhardt Fellowship, McGill University
- Graduate Excellence Award, McGill University
- Graduate Mobility Award, McGill University
- Trainee Fellowship, NSERC Technologies for Exoplanetary Sciences program
- X-I2 Internship Award, NSERC Technologies for Exoplanetary Sciences program

2016/2017

- Robert Wares Fellowship, McGill University
- Carl Reinhardt Fellowship, McGill University
- Graduate Excellence Award, McGill University

2015/2016

- Canada Graduate Scholarship - Master's, NSERC

Professional activities

- Postgraduate representative, IT Committee, Department of Earth Sciences, University of Cambridge, UK (2022–)
- LGBTQ+ officer, Middle Common Room Committee (postgraduate society), St. Catharine's College, University of Cambridge, UK (2021–2022)
- Officer, Harding Scholarship Residential Committee, University of Cambridge, UK (2022)
- Planet Lunch curator, Department of Earth & Planetary Sciences, McGill University, Montréal, CA (2018)

Outreach activities

Volunteering

- Collections care volunteer, Sedgwick Museum of Earth Science, University of Cambridge, UK (2020)
- Cambridge Hands-On Science demonstrator, Cambs., UK (2019)

Public talks

- "How to image Earth 2.0", Astronomy on Tap, Montréal, CA (2018)

Press

- "Water World or Land Planet: What Determines Ocean Coverage on Rocky Exoplanets?" *AAS Nova* (science highlight feature), 30 March 2022, web
- "The Young Earth Under the Cool Sun," *AGU Eos* (science news feature), 22 February 2022, web