Tereza Constantinou

Cambridge, UK email terezaconst.github.io terezaconst

Education

Institute of Astronomy, University of Cambridge, Trinity College Oct 2022 – Present
PhD in Astronomy; supervised by Prof. Oliver Shorttle and Dr Paul B. Rimmer

I combine chemical-kinetics, geochemical cycling, thermochemistry, and statistical methods. Within the Solar System, I have constrained Venus's past interior, volcanic outgassing, ancient oceans, and lightning, now extending to its tectonics and carbon cycle compared to Earth's. Beyond, I developed an empirical biosignature framework, am distinguishing lifeless worlds from those shaped by life, and exploring life's influence on habitability. I also collaborate on Venus's atmosphere-surface interactions, and early Earth's atmospheric chemistry.

University of Cambridge, Trinity College Oct 2019 – Jun 2020
Master of Astrophysics (M.Sci.) — 1st Class Honours

- Research Project: "The Atmospheric Chemistry of Venus and Interactions with the Surface", supervised by Dr Paul Rimmer and Dr Oliver Shorttle
- Specialisation: Planetary Science, Exoplanets, Computational Modelling, Relativistic Astrophysics

University of Cambridge, Trinity College Oct 2016 – Jun 2019
Bachelor of Natural Sciences (B.A. Hons, M.A.)

- 3rd year Research Review (lunar surface) and Research Project (ferromagnetism in python) — 1st Class
- 2nd and 3rd years: Theoretical Physics, Mathematics
- 1st year: Earth Sciences, Mathematics, Physics, Material Science

Publications

4 first-author (1 published, 3 under review), 5 co-author (4 published, 1 under review)

- **Poweful lightning constrained by atmospheric NO**
  T. Constantinou, O. Shorttle, P.B. Rimmer
  Planetary Science Journal (in review)
- **Prediction of sulphate hazes in the lower Venus atmosphere**
  P. Woitke, M. Scherf, C. Helling, P.B. Rimmer, M. Ferus, H. Lammer, ..., **T. Constantinou**
  Planetary Science Journal (2025)
- **Did Venus ever have oceans?**
  T. Constantinou, G. Gillmann, S. Jordan, P.B. Rimmer, A. Rimmer, M. Turbet
  Chapter to be published in Scrivener-Wiley book
- **Comparative Biosignatures**
  T. Constantinou, O. Shorttle, M. Cranmer, P.B. Rimmer
  MNRAS (in review)
- **Abiotic Ozone in the Observable Atmospheres of Venus and Venus-like Exoplanets**
  R. Calder, O. Shorttle, S. Jordan, P.B. Rimmer, **T. Constantinou**
  MNRAS (2025)
- **A dry Venusian interior constrained by atmospheric chemistry**
  T. Constantinou, O. Shorttle, P.B. Rimmer
  Nature Astronomy (2024)
- **Large Interferometer For Exoplanets (LIFE). XIV. Finding terrestrial protoplanets in the galactic neighborhood**
  L. Cesario, T. Lichtenberg, E. Alei,..., **T. Constantinou**, the LIFE Collaboration
  Astronomy & Astrophysics (2024)
- **Hydroxide Salts in the Clouds of Venus: Their Effect on the Sulfur Cycle and Cloud Droplet pH**
  P.B. Rimmer, S. Jordan, **T. Constantinou**, P. Woitke, O. Shorttle, R. Hobbs, A. Paschodimas

The Planetary Science Journal (2021)

- **Photochemistry of Venus-like Planets Orbiting K- and M-dwarf Stars**
  S. Jordan, P.B. Rimmer, O. Shorttle, **T. Constantinou**
  The Astrophysical Journal (2021)

Awards and funding

- Travel sponsorship for Breakthrough Discuss Conference (£1200 from Breakthrough Initiatives), 2025
- **'Best Presentation Award'**, Leverhulme Centre for Life in the Universe Annual Science Day, 2025
- **'Murdin Prize'**, best publication by a Ph.D. student in Astronomy, University of Cambridge, 2024
- Travel funds for VeReDo Kick-Off Meeting (£1200 from VeReDo), 2025
- Travel funds for Life in the Universe II Conference ($700 from Northeastern University), 2023
- Fee waiver for UK Exoplanet Conference (£200 from conference), 2023
- **STFC Studentship** for study towards a PhD in Cambridge (£85K), 2022-2026
- **'Institute of Astronomy Project Prize'**, best master's research project, 2020

Talks and Posters

- **Invited seminar:** *"Defining lifeless worlds with Venus"*
  Center for Space and Habitability, University of Bern, Switzerland, October 2025
- **Invited seminar:** *"Defining lifeless worlds with Venus"*
  Geophysical Fluid Dynamics Seminars, ETH Zurich, Switzerland, October 2025
- **Co-hosted seminar:** *"Habitability of Icy Moons"*
  LCLU Coffee Meetings, Cambridge, UK, April 2025
- **Talk:** *"Comparative Biosignatures"* – Best Presentation Award
  LCLU Science Day, Cambridge, UK, March 2025
- **Invited talk:** *"Was Venus Ever Habitable?"*
  VeReDo Kick-off Meeting, Graz, Austria, November 2024
- **Invited Poster:** *"Comparative Biosignatures"*
  Origins Federation, Cambridge, UK, September 2024
- **Invited Seminar:** *"Link Between Geochemistry and Atmospheres"*
  LCLU Coffee Meetings, Cambridge, UK, January 2024
- **Talk:** *"Was Venus Ever Habitable?"*
  Rocky Worlds III, Zurich, Switzerland, January 2024
- **Talk:** *"Was Venus Ever Habitable?"*
  IoA Wednesday Seminar, Cambridge, UK, October 2023
- **Invited Poster:** *"Was Venus Ever Habitable?"*
  Life in the Universe II, Boston, US, September 2023
- **Talk:** *"Was Venus Ever Habitable?"*
  UKEXOM 2023, London, UK, August 2023
- **Talk:** *"Was Venus Ever Habitable?"*
  LCLU Science Day, Cambridge, UK, March 2023
- **Invited talk:** *"Venus as Candidate for Constraining Volcanism and Surface Conditions"*
  RAS Specialist Discussion Meeting: Abiotic baselines in astrobiology, London, UK, January 2023

Publicity and Outreach

- Over 750 international pieces of media coverage for "A dry Venusian interior constrained by atmospheric chemistry" ; including The Guardian , Reuters , Daily Mail , Independent , and Sky News .
- Podcast interview with BBC World Service - Science in Action about my work on Venus (2024)
- Podcast interview about my work on Venus with BBC Cambridge's The Naked Scientists (2024)
- Youtube interview with EarthSky about my work on Venus (2024)
- Hosted star-gazing for Public Open Evenings (2022-2023)

- Organised and ran Venus-themed workshop for departmental Public Open Day (>1000 attendees, 2024)

Teaching

- 'Topics in Astrophysics' Supervisor for Astronomy Part II (2024-2025)
- 'Reading Group' Supervisor for the Planetary Science and Life in the Universe MPhil (2024-2025)
- Supervised a summer intern on the formation and composition of Mercury (2023)
- Private tutor for Physics, Maths, and Oxbridge interview prep (2020-present)

Academic service

- Co-ran breakout session for Life in the Universe III Conference (2024)
- Co-organised Conference: Leverhulme Centre for Life in the Universe Annual Science Day, Cambridge (2024)
- Reviewed 1 research paper, 1 book proposal (2023-present)
- Wellbeing Advocate, Institute of Astronomy (2022-present)
- Exoplanet Journal Club Organiser, Cambridge (2022-present)
- Work-life balance Focus Group Member, EDI Committee (2022-present)
- International Women's Day Co-Organiser, Institute of Astronomy (2022-2024)
- Student Representative, Cavendish Laboratory & Institute of Astronomy (through undergrad, masters & PhD)

Other Work Experience

DocMe (BioTech Startup), London, UK Jun 2021 – Sep 2021
Lead ML/AI Engineer

- Created company management structure, led product roadmap, and managed 4-person ML team.
- Conducted competitor analysis and business plan refinement, resulting in three £10,000 pilot contracts.

Machine Learning Engineer Jan 2021 – Jun 2021

- Designed medical-grade algorithms to measure SpO_2, heart rate, respiratory rate, and HRV from selfie videos.

Diverium (VR Tech Startup), London, UK Sep 2020 – Dec 2020
Team Founding Member / Lead Software Engineer

- Built two backend REST APIs with Django and Docker using TDD on Ubuntu, and linked Unity3D mobile app to backend via C# and JSON.

Education Partnerships Africa (Charity), Kisii, Kenya Jul 2019 – Sep 2019
Volunteer Project Worker

- Raised £4,000 for in-situ development work in rural Kenya through online fundraising.
- Led 7 concurrent projects, incl. water collection and purification, hygiene programs, and facility renovations.

Procter & Gamble (P&G), Newcastle, UK Jul 2018 – Sep 2018
R&D Intern – Product Research

- Developed and implemented a laboratory method for testing new laundry detergent scents, adopted as a SOP.

BP Institute for Multiphase Flow, University of Cambridge, UK Jun 2017 – Jul 2017
Geophysics Research Assistant

- Designed and executed laboratory experiments; analysed results with MATLAB video processing.
- Built a model for gravity currents in V-shaped valleys, relevant to seabed and volcanic canals

Technical skills

Technologies: Python, Git, Jupyter (advanced); R, C++, Fortran, MATLAB, Django, Unity (intermediate)
Languages: English (fluent), Greek (native), French (intermediate)