Tereza Constantinou

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Education

Institute of Astronomy, University of Cambridge, Trinity College Oct 2022 – May 2026
PhD in Astronomy; supervised by Prof. Oliver Shorttle and Dr Paul B. Rimmer

- My PhD re-framed a central question in astrobiology: to recognise life elsewhere in the universe, we must first define lifelessness. Using Venus as a test case, I studied its atmosphere, volcanism, and weathering to reconstruct the history of a lifeless Earth-like world. That work culminated in a statistical framework for identifying both life, and its absence, beyond Earth, as anomalies against an abiotic baseline.
- Methods at intersection of planetary science, atmospheric chemistry, geochemistry, astrobiology, & statistics.

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

- Research project: "The Atmospheric Chemistry of Venus and Interactions with the Surface"
- 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.) – First Class for project work

- Course background: Physics, Mathematics, Earth Science, and Materials Science

Post-doctoral Positions

Postdoctoral Fellow, Stockholm University, Sweden Nov 2026 – present

- Quantifying methane emissions from subsea permafrost on the Arctic shelves under present and future conditions

Publications

- **Life as an anomaly against a systemic abiotic baseline**
  T. Constantinou
  Nature Astronomy (in press.)
- **Finding lifeless worlds using the atmospheric building blocks of life**
  T. Constantinou, O. Shorttle, P.B. Rimmer
  (preprint)
- **Equifinality of Venus-like CO_2 atmospheres**
  T. Constantinou, O. Shorttle, H. Nicholls
  MNRAS (2026)
- **Detecting habitable exoplanet atmospheres with LIFE, the Large Interferometer for Exoplanets**
  S Rugheimer, A Weatherbee, J Fecanin, ..., **T. Constantinou**, et al.
  White paper submitted to the UK Space Agency's initiative "UK Space Frontiers 2035" (2026)
- **Comparative biosignatures with systemic retrievals**
  T. Constantinou, O. Shorttle, M. Cranmer, P.B. Rimmer
  MNRAS (2026)
- **Detecting habitable exoplanet atmospheres with LIFE, the Large Interferometer for Exoplanets**
  White paper submitted to the UK Space Agency's initiative "UK Space Frontiers 2035" (2026)
  S. Rugheimer, A. Weatherbee, J. Fecanin, A. Glasse, ..., **T. Constantinou**, et al.
- **The rainout of formaldehyde favors a formose-based origin of life in shallow ponds**
  M. Scherf, **T. Constantinou**, P.B. Rimmer, P. Woitke, M. Ferus, H. Lammer, et al.
  Nature Communications (preprint)
- **Powerful Lightning On Venus Constrained By Atmospheric NO**
  T. Constantinou, O. Shorttle, P.B. Rimmer
  Planetary Science Journal (2025)
- **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 in press. for Scrivener-Wiley book
- **Veil or Shroud: two tales of the atmospheric evolution of Venus**
  G. Gillmann, **T. Constantinou**, M. Scherf, H. Lammer, K. Gillmann
  Chapter in press. for Scrivener-Wiley book
- **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

Awards

- Observing time on the NASA Infrared Telescope Facility for high-resolution spectroscopic observations of Venus's atmosphere (8 hours), 2026.
- **'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
- **'Institute of Astronomy Project Prize'**, best master's research project, 2020

Funding

- Travel sponsorship for Breakthrough Discuss Conference (£1400 from Breakthrough Initiatives), 2026
- Travel sponsorship for Breakthrough Discuss Conference (£1200 from Breakthrough Initiatives), 2025
- 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

Publicity and Outreach

- Podcast interview with BBC World Service about my work on Venus (2024)
- 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 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)

Talks and Posters

- **Invited seminar:** *"Defining lifeless worlds with Venus"*
  CSH, University of Bern, Switzerland, October 2025
- **Invited seminar:** *"Defining lifeless worlds with Venus"*
  Geophysical Fluid Dynamics Seminars, ETH Zurich, Switzerland, October 2025
- **Shortlisted awards talk:** *"Was Venus Ever Habitable?"*
  James William Award Colloquium, UK, June 2025
- **Invited 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?"*
  VeRaDo 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, September 2023
- **Invited talk:** *"Venus as Candidate for Constraining Volcanism and Surface Conditions"*
  RAS Specialist Discussion Meeting: Abiotic baselines in astrobiology, London, UK, January 2023

Teaching

- 'Reading Group' Supervisor for the Planetary Science and Life in the Universe MPhil (2024-2026)
- 'Topics in Astrophysics' Supervisor for Astronomy Part II (final year of BA, 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

- International Women's Day panel member, Institute of Astronomy (2026)
- 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)
- Reviewer for Icarus, reviewed 1 book proposal (2023-present)
- Wellbeing Advocate, Institute of Astronomy (2022-2026)
- Conceived and Organised Exoplanet Journal Club, Cambridge (2022-2025)
- Work-life balance Focus Group Member, EDI Committee (2022-2026)
- International Women's Day Co-Organiser, Institute of Astronomy (2022-2024)
- Student Representative, Cavendish Laboratory & Institute of Astronomy (through undergrad, masters & PhD)

Pre-doctoral Positions

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

- Promoted to lead a 4-person team, shaped product roadmap, and secured pilot contracts after developing medical-grade algorithms to extract vital-signs from video selfies.

Team Founding Member, Diverium (VR Tech Startup), UK Sep 2020 – Dec 2020

- Built the website, app backend, and app frontend.

Volunteer Project Worker Education Partnerships Africa, Kenya Jul 2019 – Sep 2019

- Led in-situ development work in rural Kenya on water collection and purification, hygiene programmes, and facility renovations, supported by £4,000 in online fundraising.

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

- Developed a lab method for testing new laundry detergent scents, later adopted as a standard operating procedure.

Intern, Institute for Energy and Environmental Flows, UK Jun 2017 – Jul 2017

- Designed laboratory experiments and analysed results with MATLAB video processing.

Scientific computing: Python, Git, Jupyter (advanced); R, MATLAB, Fortran, C++ (working knowledge)
Languages: English and Greek (fluent); French (intermediate)