Larissa Palethorpe

Royal Society Career Development Fellow

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Education

Institute for Astronomy, University of Edinburgh *Edinburgh, UK*

PhD Astronomy *Oct 2021 - Dec 2025*

- **Characterising Small Exoplanets**, Advisors: Prof. Ken Rice, Dr. Vincent Van Eylen (MSSL, UCL)
- Secured fully funded PhD offers at both the University of Edinburgh and UCL, negotiating a unique collaborative arrangement where I am co-supervised by both institutions.
- Analysed HARPS-N data alongside K2, TESS, and CHEOPS exoplanet data to investigate the radius gap in small exoplanet populations, contributing to the understanding of atmospheric loss, planet formation, and the frequency of Earth-analogues.
- Utilised advanced programming skills in Python and Linux to analyze and model exoplanet properties.
- Collaborated with the HARPS-N and Kesprint consortia, leading international teams, to develop techniques for studying exoplanet populations.

University of Nottingham *Nottingham, UK*

MSci Physics with Astronomy, First with Honors (75.9%) *Sept 2017 - Aug 2021*

- **The Effect of Environment on Galaxy Formation**, Advisor: Dr. Nina Hatch
- Analysed multi-wavelength data from the Very Large Telescope to estimate galaxy masses and star formation rates, comparing their evolution across different environments in distant galaxy clusters.
- **Artificially Redshifting Galaxies with Neural Networks**, Advisor: Dr. Steven Bamford
- Developed neural network models to account for observational effects in galaxy imaging, enabling the study of intrinsic galaxy evolution across cosmic history.

Research Experience

The Royal Society, University of Bristol *Bristol, UK*

Career Development Fellow *Jan 2026 - Dec 2029*

- **Tiny Worlds, Tremendous Insights: Analysis of Exoplanets in Transitional Zones**, Mentor: Dr. Hannah Wakefield
- Awarded £560,000 to pursue independent research into small exoplanets for 4 years at my choice of host institution.

European Space Agency *Leiden, the Netherlands*

Summer Research Student *June 2021 - Aug 2021*

- **Using Gaussian Processes to Study Exoplanet Transits and Stellar Variability Simultaneously**, Advisors: Dr. Oliver Hall, Dr. Nicolas Crouzet

Institute of Astronomy, University of Cambridge *Cambridge, UK*

Summer Research Intern *July 2020 - Sept 2020*

- **When did the Sagittarius Galaxy Lose its Star Clusters?** Advisor: Dr. Eugene Vasiliev
- E. Vasiliev, V. Belokurov, D. Erkal. (2021). *Tango for three: Sagittarius, LMC, and the Milky Way*. MNRAS, 501, 2279. Thanked in acknowledgments.

Honors & Awards

Students' Association Teaching Award Nominee, University of Edinburgh *February 2025*

3 Minute Thesis University Grand Finalist, University of Edinburgh *June 2024*

STEM for Britain Finalist, Houses of Parliament, London *March 2024*

Nottingham Advantage Award, University of Nottingham *June 2021*

Winner of the Research Opportunity Scholarship, University College London - (Declined) *May 2021*

School of Physics & Astronomy Fully-Funded PhD Grant, University of Edinburgh *April 2021*

Development Workshops

September 2025. **BOWIE+ JWST Cycle 5 Proposal Meeting**, contributed to collaborative development of JWST Cycle 5 proposals through idea generation, instrument planning, and team discussions. Gained experience in proposal coordination, technical preparation using ETC and APT tools, and strategic planning for exoplanet atmosphere observations.

September 2024. **JWST Proposal Workshop**, gained skills in proposal structuring, scientific justification, and practical application of JWST instruments to support research of exoplanet atmospheres.

June 2024. **Astrostatistics**, learnt about key statistical and machine learning techniques — such as Bayesian inference, MCMC, and time series analysis — tailored for rigorous astronomical data analysis and interpretation.

May 2023. **4th Advanced School on Exoplanet Science**, gained expertise in computational tools and coding best practices for astrophysics research, including data analysis, reproducibility, and efficient software application, to strengthen my technical and collaborative research skills.

July 2022. **Blackett Lab Family Rising Stars Research School**, a career development workshop for UK-based physicists and engineers of Black heritage, where I enhanced my skills in science communication, networking, and research leadership through panel discussions, writing courses, and tailored CV clinics.

March 2022. **GPRV Workshop**, focused on overcoming stellar activity in RV planet searches, engaging in discussions on advanced techniques for data reduction, activity characterisation, and modelling in time and wavelength domains, while fostering collaborations and contributing to community-driven research efforts.

Professional Memberships

TESS Follow-Up Working Sub-Groups 4 & 5, Member — *Since November 2023*
Royal Astronomical Society, Fellow — *Since December 2021*
Kesprint Consortium, Member — *Since October 2021*
HARPS-N Guaranteed Time Observations Group, Member — *Since October 2021*
Institute of Physics, Member — *Since July 2020*

Conferences & Public Talks

Contributed Presentations

February 2026. *The Search for Planet b.* **Invited public talk**: Northamptonshire Natural History Society, Northampton, UK.

September 2025. *PhD Insights.* **Invited panel member**: Amplify 2025: The Black Undergraduate Physics Symposium, University of Southampton, UK.

March 2025. *Space Settlement: Dream or Dystopia?* **Invited public talk**: Dark Space Planetarium, Kirkudbright, UK.

January 2025. *Gliese 12 b, A Temperate Earth-sized Planet at 12pc*. Contributed **talk**: Scottish Exoplanet Meeting, University of Edinburgh, UK.

October 2024. *The Search for Planet b*. **Invited public talk**: Tweeddale Astronomical Society, Peebles, UK.

September 2024. *Shall I do a PhD?* **Invited panel member**: Amplify 2024: The Black Undergraduate Physics Symposium, University of Manchester, UK.

June 2024. *Characterising Small Exoplanets*. Contributed **public talk**: 3 Minute Thesis University Grand Final, University of Edinburgh, UK.

April 2024. *Characterising Small Exoplanets*. Contributed **talk**: IfA Colloquium, University of Edinburgh, UK.

April 2024. *The Search for Planet b*. **Invited public talk**: Dark Space Planetarium, Kirkudbright, UK.

April 2024. *Gliese 12 b, A Temperate Earth-sized Planet at 12pc*. **Keynote talk**: UK Exoplanet Meeting 2024, University of Birmingham, UK.

May 2023. *Confronting compositional confusion through the characterisation of a sub-Neptune*. Contributed **talk**: 4th Advanced School on Exoplanetary Science, Vietri sul Mare, Italy.

April 2022. *Characterising Small Exoplanets*. Contributed **talk**: London Exoplanet Day, Imperial College London, UK.

Contributed Posters

March 2026. *Constraining Small Planet Compositions for Future Missions*. Poster: UK Exoplanet Meeting, Bristol, UK.

April 2025. *Refining Exoplanet Bulk Densities: Insights from CHEOPS, HARPS-N, K2, and TESS*. Poster: UK Exoplanet Meeting, Leeds, UK.

June 2024. *Confronting Compositional Confusion through the characterisation of the sub-Neptune orbiting TOI-1778*. Poster: Exoplanets 5, Leiden, Netherlands.

March 2024. *Confronting Compositional Confusion through the characterisation of the sub-Neptune orbiting TOI-1778*. Poster: Extreme Solar Systems V, Christchurch, NZ.

August 2023. *Confronting Compositional Confusion through the characterisation of the sub-Neptune orbiting TOI-1778*. Poster: UK Exoplanet Meeting 2023, University College London, UK.

December 2023. *Confronting Compositional Confusion through the characterisation of the sub-Neptune orbiting TOI-1778*. Poster: Cormack Meeting, Glasgow, UK.

Teaching & Supervision Experience

Teaching

Scientific Programming & Data Analysis, Teaching Assistant *Autumn 2022, 2025*
Discovering Astronomy, Teaching Assistant *Autumn 2021, 2025*
Physics & Geoscience Outreach & Engagement, Invited Guest Lecturer *Spring 2025*
Astrobiology Methods (for MSc Astrobiology & Planetary Sciences), Invited Guest Lecturer *Spring 2024, 2025*
Introductory Astrophysics, Chief Teaching Assistant *Spring 2023, 2025*
Astrobiology, Teaching Assistant *Autumn 2024*
Scientific Image Analysis, Teaching Assistant *Spring 2024*
Astrophysics: Stars and Planets, Teaching Assistant *Autumn 2023*
Computer Modelling, Teaching Assistant *Autumn 2023*
Introductory Astrophysics, Teaching Assistant *Spring 2022*
Computer Simulation, Teaching Assistant *Spring 2022*

Supervision

Physics & Geoscience Outreach & Engagement, Supervisor *Autumn 2022 - Spring 2025*

- Supervised a total of eight students in designing and delivering community-focused physics outreach projects, enhancing their skills in science communication, project management, and public engagement. I also led my own workshop sessions, teaching skills I have learned through my experience in science communication.

Outreach

Guest Scientist - Space Fair Booth, Broughton Primary School *June 2025*
Guest Speaker on Career Pathways in Astronomy, Kirkudbright Academy *April 2024, March 2025*
International Women's Day/Science Week Guest Speaker, Southbank International School *March 2025*
Interview Explaining My Research for School Audiences, YouTube *Nov 2024*
STEM Workshop Facilitator for Girl Guide Leaders, Royal Observatory Edinburgh *Nov 2024*
Open Weekend Volunteer, Royal Observatory Edinburgh *Sept 2024*
Higgs Chats Interviewer, Higgs Centre for Theoretical Physics *Oct 2021 - Sept 2023*
BAME Representative, School of Physics & Astronomy, University of Edinburgh *Sept 2022 - Aug 2023*
Student Community Committee Member, Institute of Physics *Sept 2021 - Aug 2023*
#BlackinPhysics Week Guest Speaker, Physics World Weekly Podcast *Oct 2022*
A Day In The Life of 3 Physicists Interviewee, International Women's Day *March 2022*
East Midlands Regional Committee Member, Institute of Physics *Oct 2020 - July 2021*

- Assisted in the design of a GirlGuiding IOP badge to encourage girls to get involved in Physics from a young age. I also took the lead in the initiative to help launch the badge internationally.

Peer Mentor, School of Physics & Astronomy, University of Nottingham *Oct 2018 - Dec 2020*

Science Communication & Media

Media Release Highlights on the Discovery of Gliese 12 b

NASA Press Release: featuring my joint-first authorship publication, titled 'NASA's TESS Finds Intriguing World Sized Between Earth, Venus'.

Interview: for a CNN article titled 'Scientists have discovered a theoretically habitable, Earth-size planet'.

Interview: for a New Scientist article titled 'Earth-like exoplanet found just 40 light years away – the closest yet'.

Interview: for a Sky News article titled 'New planet that could support human life discovered 'close' to Earth by UK scientists'.

Live radio interview: for CKNW in Vancouver, Canada about the process of the discovering of Gliese 12 b.

Live radio interview: for Newstalk radio in Dublin, Ireland about the process of the discovering of Gliese 12 b.

Interview: for an article in Dazed Magazine, titled 'Among the stars is a life we imagined'.

Interview: for the 200th special episode, titled 'Discovering Planet b', of the Astronomy Astrophiz podcast.

Science Communication

Invited expert: on 'Exoplanets - Strange New Worlds' episode for BBC Sky at Night, aired on BBC 4 in July 2025.

Invited opinion: on 'Brian Cox: Seven Days on Mars' documentary for BBC Points of View, aired on BBC 1 in June 2022.

Article: written for Astrobites, titled 'Using Gaussian Processes to Study Exoplanet Transits & Stellar Variability Simultaneously', about the research conducted during my internship at ESA, published October 2021.

Publications

First-authored publications

** indicates joint first-authorship*

Larissa Palethorpe et al. [17 authors]. Monthly Notices of the Royal Astronomical Society, in review (2026). *Constraining Small Planet Compositions for Future Missions*. **Contribution:** Performed analysis of ten planets across six systems to investigate trends in interior composition and evolutionary pathways, focusing on small planets in the radius valley; sole author of the manuscript.

Shishir Dholakia,* **Larissa Palethorpe*** et al. [36 authors]. Monthly Notices of the Royal Astronomical Society, 531, 1276 (2024). *Gliese 12 b, A Temperate Earth-sized Planet at 12 Parsecs Discovered with TESS and CHEOPS*. **Contribution:** Joint first author. Led half of the analysis and co-wrote the manuscript. Principal Investigator for CHEOPS observations. Coordinated publication timelines with an independent team investigating Gliese 12 b, and collaborated with NASA to organise a joint press release.

Larissa Palethorpe et al. [32 authors]. Monthly Notices of the Royal Astronomical Society, 529, 3323 (2024). *Confronting compositional confusion through the characterization of the sub-Neptune orbiting HD 77946*. **Contribution:** Led the planetary analysis and full characterisation of the target; wrote the manuscript. Co-authors contributed stellar and interior structure analysis and provided feedback through to acceptance.

Co-Authored Publications

Thomas G. Wilson et al. **including Larissa Palethorpe** [176 authors]. Science 0, eadl2348. *Gas-depleted planet formation occurred in the four-planet system around the red dwarf LHS 1903*. **Contribution:** RV observations of target taken at the TNG, La Palma.

Ben S. Lakeland et al. **including Larissa Palethorpe** [51 authors]. Monthly Notices of the Royal Astronomical Society, 546, 4, (2026). *Discovery and characterization of two exoplanets orbiting the metal-poor, solar-type star TOI-5788 with TESS, CHEOPS, and HARPS-N*. **Contribution:** RV observations of target taken at the TNG, La Palma.

Florian Lienhard et al. **including Larissa Palethorpe** [99 authors]. Monthly Notices of the Royal Astronomical Society, 545, 3 (2026). *HARPS-N, TESS, and CHEOPS* discover a transiting sub-Neptune and two outer companions around the bright solar analogue HD 85426*. **Contribution:** RV observations of target taken at the TNG, La Palma.

Daisy Turner et al. **including Larissa Palethorpe** [63 authors]. Monthly Notices of the Royal Astronomical Society, 545, 1 (2026). *The mass of the exo-Venus Gliese 12 b, as revealed by HARPS-N, ESPRESSO, and CARMENES*. **Contribution:** Principal Investigator of CHEOPS observations and Co-Investigator of ESPRESSO observations of target used in paper.

Mario Damasso et al. **including Larissa Palethorpe** [24 authors]. Accepted to Astronomy & Astrophysics, 702, A118 (2025). *Discovery of a multi-planetary system orbiting the aged Sun-like star HD 224018*. **Contribution:** RV observations of target taken at the TNG, La Palma.

Davide Gandolfi et al. **including Larissa Palethorpe** [115 authors]. Accepted to Astronomy & Astrophysics (2025). *A four-planet system orbiting the old thick disk star TOI-1203*. **Contribution:** provided critical feedback and constructive revisions.

Other Publications

Joanna K. Barstow et al. **including Larissa Palethorpe** [67 signatories]. White paper (arXiv:2601.06233, 2026). *Exoplanet characterization with NASA's Habitable Worlds Observatory*. **Contribution:** Co-signatory on community white paper.

Joanna K. Barstow et al. **including Larissa Palethorpe** [47 signatories]. White paper (arXiv:2601.06236, 2026). *Transiting exoplanets as the immediate future for population-level atmospheric science*. **Contribution:** Co-signatory on community white paper.

Vincent Van Eylen et al. **including Larissa Palethorpe** [171 signatories]. White paper (arXiv:2512.16416, 2025). *Transformational astrophysics and exoplanet science with the Habitable Worlds Observatory High Resolution Imager*. **Contribution:** Co-signatory on community white paper.

Shreyas Vissapragada et al. **including Larissa Palethorpe** [8 authors]. Hubble Space Telescope Proposal, Cycle 31, ID #17600 (2024) | NASA ADS. *The Exosphere of a Venus-Like Exoplanet*. **Contribution:** Co-Investigator. Contributed to proposal abstract for HST observations targeting the atmospheric composition of a Venus-like exoplanet, with a focus on atmospheric escape processes.

Larissa Palethorpe et al. [32 authors]. VizieR Online Data Catalog (2024). *VizieR Online Data Catalog: HD 77946 RV curves.* **Contribution:** Provided and published the RV data underlying the analysis in Palethorpe et al. (2024), supporting research on exoplanetary systems.

Larissa Palethorpe. Physics World, 35, 49 (2022). *Pursuing joy in an alien world*. **Contribution:** Personal essay reflecting on experiences as a minority in academia; published during #BlackinPhysics Week 2022.