

LILI ALDERSON

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EDUCATION

PhD in Astrophysics

Sep 2020 - present

University of Bristol

- Supervisor: Dr. Hannah Wakeford
- Research Focus: Exoplanet Atmospheres with the HST and JWST

MPhys Astrophysics with a Year Abroad

Sep 2016 - Jul 2020

University of Southampton & Center for Astrophysics | Harvard-Smithsonian

- Classification: First Class
- Thesis Title : LRG-BEASTS: Ground-based Transmission Spectroscopy of the Atmosphere of the Highly Inflated Hot-Saturn WASP-21b
- One of the 5 best academically performing students and therefore selected to spend my final year in research at the Center for Astrophysics | Harvard-Smithsonian, in Cambridge, MA, USA
- Selected as one of the 12 best academically performing students for the Design and Observation in Astronomy module, involving a week observing at Teide Observatory, Tenerife, Spain

Prior Education

Sep 2009 - Jul 2016

Bournemouth School for Girls

- A-Levels in Physics (A), Mathematics (A) and Geography (B); AS-Level in French (B)
- 12 GCSEs (8 A*s, 4 As), including English (A*) and Maths (A*)

CONFERENCES AND PROFESSIONAL TALKS

Invited Conference Talks

- **Nov 2022** - Celebrating JWST's first six months of exoplanet data, Ringberg Castle, Germany - "*WASP-39b Through the Eyes of JWST NIRSpec G395H*"

Contributed Conference Talks

- **Jul 2022** - UK National Astronomy Meeting (NAM), University of Warwick, UK - "*Revisiting a Classic: Comprehensive Reanalysis of the Transmission Spectrum of the Hot Jupiter WASP-17b*"
- **Apr 2021** - UK Exoplanet Community Meeting (UKEXOM), University of Birmingham, UK (Online) - "*LRG-BEASTS: Sodium in the Atmosphere of the Hot-Saturn WASP-21b*"
- **Jan 2021** - UKRI STFC Introductory Course in Astronomy for New Research Students, Armagh Observatory and Planetarium, UK (Online) - "*Measuring the Atmosphere of WASP-21b*"

Contributed Conference Posters

- **September 2022** - UK Exoplanet Community Meeting (UKEXOM), University of Edinburgh, UK (Online) - "*Revisiting a Classic: Comprehensive Reanalysis of the Transmission Spectrum of the Hot Jupiter WASP-17b*", **Alderson, L.**, et al.
- **May 2022** - Exoplanets IV, Las Vegas, NV, USA - "*Revisiting a Classic: Comprehensive Reanalysis of the Transmission Spectrum of the Hot Jupiter WASP-17b*", **Alderson, L.**, et al.
- **Jul 2021** - UK National Astronomy Meeting 2021, Bath, UK (Online) - "*Astrobites: Blogging about astrophysics*", Haggard, R., Ramasawmy, J., **Alderson, L.**, et al.

- **May 2021** - Emerging Researchers in Exoplanet Science Symposium (ERES), Princeton, NJ, USA (Online) - *“LRG-BEASTS: Ground-based Detection of Sodium and a Steep Optical Slope in the Atmosphere of the Highly Inflated Hot-Saturn WASP-21b”*, **Alderson, L.**, et al.
- **Jul 2020** - Exoplanets III, Heidelberg, Germany (Online) - *“LRG-BEASTS: Ground-based Detection of Sodium and a Steep Optical Slope in the Atmosphere of the Highly Inflated Hot-Saturn WASP-21b”*, **Alderson, L.**, et al.
- **Jan 2020** - 235th American Astronomy Society (AAS) Meeting, Honolulu, HI, USA - *“Transmission Spectroscopy of the Highly Inflated Hot Saturn WASP-21b”*, **Alderson, L.**, et al.

Seminars and Colloquia

- **June 2022** - Astronomical Data Group Community Meeting, CCA Flatiron Institute, NY, USA (Online) - *“Retrievals of WASP-17b”*
- **May 2022** - Astrophysics Seminar, American Museum of Natural History, NY, USA (Online) - *“Exploring Exoplanet Atmospheres with Multi-wavelength Observations”*
- **May 2022** - Planetary Lunch, University of California: Santa Cruz, CA, USA (Online) - *“Exploring Exoplanet Atmospheres with Multi-wavelength Observations”*
- **Apr 2022** - CIERA Science Happy Hour, Northwestern University, IL, USA (Online) - *“Revisiting a Classic: Comprehensive Reanalysis of the Transmission Spectrum of the Hot Jupiter WASP-17b”*
- **May 2020** - Exoplanet Presentation Seminar Series, Center for Astrophysics | Harvard-Smithsonian, MA, USA (Online) - *“LRG-BEASTS: Ground-based detection of Na and aerosols in the atmosphere of WASP-21b”*
- **May 2020** - STARGATE Collaboration Seminar (Online) - *“LRG-BEASTS: Ground-Based Transmission Spectroscopy of the Highly Inflated Hot Saturn WASP-21b”*

PREVIOUS ACADEMIC PROJECTS

Characterising Exoplanet Atmospheres

Sep 2019 - Jul 2020

Center for Astrophysics | Harvard-Smithsonian

- Worked to characterise the atmosphere of the exoplanet WASP-21b via transmission spectroscopy.
- Extensive use of Python to reduce and fit transit light curves and atmospheric models
- Work formed my master’s thesis, and was published in MNRAS

Undergraduate Observational Astronomy Project

March - May 2018

University of Southampton & Teide Observatory

- Organised 6 nights of observations for 12 undergraduate students, operating a variety of telescopes to take data for my own and other projects
- Data used to calculate the total and surface area normalised Star Formation Rates (SFR) of late-type spiral galaxies to analyse how SFR changes with galaxy spirality.
- Work presented as both a report and in a poster presentation session to PhD students and faculty at the University of Southampton.

Gamma Ray Telescope Design

March 2018

Universidad de La Laguna, Tenerife, Spain

- Co-project manager of a team of eight undergraduate and masters students from University of Southampton, Universidad de La Laguna and University College Dublin, designing a gamma ray telescope to study nucleosynthesis in supernovae
- Responsibilities as co-project manager included ensuring team stuck to deadlines and preparing team for daily assessment meetings
- Personal tasks included selecting target supernovae and assessing the sensitivity of the design.
- Work presented as a final presentation to university staff and other project teams.

TEACHING AND OUTREACH

Member of Astrobites Collaboration

Jan 2021 - present

Astrobites.org

- Regular writer and editor of astrophysics research paper summaries aimed at undergraduate students. For a full summary please see [here](#). Several of my articles have been selected by AAS Nova for feature.
- Member of the Scheduling, Admin, and Diversity, Equity and Inclusion [Committees](#).
- Chair of the Scheduling Committee
- Ombudsperson

Teaching Support Assistant

Oct 2020 - present

University of Bristol

- PHYS10600 Stars & Planets, 1st Year undergraduate course
- PHYS24010 Cosmology, 2nd Year undergraduate course

Student Ambassador

Jul 2019

University of Southampton

- Gave subject talks at university open days to audiences of up to 400 prospective students and parents
- Gave tours of the Physics facilities and rooftop observatory to groups of up to 20 visitors
- Held “Virtual Open Day” webinar presentations along with academic staff

Student President of the School of Physics and Astronomy

Jun 2018 - Jul 2019

University of Southampton

- Elected by peers to oversee student-staff relations, managing a team of 12 course representatives
- Organised Staff-Student Liaison Committee meetings to address and resolve issues raised within courses, alongside weekly meetings with the Director of Programs of the school
- Surveyed students on a range of issues, presenting results to academic and administrative staff

PROFESSIONAL ACTIVITIES & SERVICES

- **2022-Present** Co-Organiser of University of Bristol (Exo)Planetary Journal Club
- **2022-Present** Chair of Astrobites Scheduling Committee
- **2022-Present** Ombudsperson for Astrobites
- **2022-Present** Member of Astrobites Admin Committee
- **2021-Present** Member of Astrobites Diversity, Equity and Inclusion Committee
- **2021-Present** Member of Astrobites Scheduling Committee
- **2022** Session Organiser at National Astronomy Meeting, Warwick
- **2020-2022** Astrophysics Postgraduation Student Representative, University of Bristol
- **Journals Refereed:** AAS Journals
- **Professional Memberships:** RAS (2020-Present)

ATTENDED WORKSHOPS

- **Celebrating JWST's first six months of exoplanet data**, Ringberg Castle, Germany, Nov 2022
- **Transiting Exoplanet Community ERS Post-Launch Data Challenge**, Hybrid (Attendance Online), March 2022
- **Transiting Exoplanet Community ERS Pre-Launch Theory Webinar**, Online, Jul-Aug 2021
- **Transiting Exoplanet Community ERS Pre-Launch Data Hackathon**, Online, Jun 2021
- **UKRI STFC Introductory Course in Astronomy for New Research Students**, Armagh Observatory and Planetarium, UK (Online), Jan 2021
- **Introductory Astrobiology**, The Open University, UK, (Online), Nov 2020

GRANTS AND AWARDS

- **2022 RAS Travel Grant**
- **2021 2nd Place, Best Student Contribution Presentation**, UKRI STFC Introductory Course in Astronomy for New Research Students, Armagh Observatory and Planetarium
- **2020 Most Outstanding Performance on an MPhys Degree**, School of Physics and Astronomy, University of Southampton
- **2020 Best Project by a Year Abroad / Final Year Research Finalist** School of Physics and Astronomy, University of Southampton
- **2019 Faculty Academic Rep Award**, University of Southampton Student Union Academic Awards

COLLABORATIONS

- **Transiting Exoplanet Community ERS Program**: Transmission Working Group Member
- **JWST GTO Telescope Scientist Team**: Project Level Exoplanet Transit Spectroscopy Member
- **COMPASS Collaboration (JWST GO-2512)**: Co-Investigator
- **STARGATE Collaboration**: Member

OBSERVATIONAL PROGRAMS

JWST

- Co-I on 2 Competitively Awarded GO Programs (150.8 Total Hours)
- Involvement in GTO and DD-ERS Programs

HST

- Co-I on 2 Competitively Awarded GO Programs (145 Total Orbits)

PUBLICATIONS

- **A Comprehensive Analysis of WASP-17b's Transmission Spectrum from Space-Based Observations,**
Alderson, L., et al. 2022, MNRAS, 512, 4185
- **Early Release Science of the Exoplanet WASP-39b with JWST NIRSpec G395H,**
Alderson, L., Wakeford, H.R., Alam, M.K., Batalha, N.E., Lothringer, J.D., The JWST Transiting Exoplanet Community Early Release Science Team et al., 2022, arXiv:2211.10488
- **Early Release Science of the Exoplanet WASP-39b with JWST NIRSpec PRISM,**
Rustamkulov, Z., The JWST Transiting Exoplanet Community Early Release Science Team et al., 2022 arXiv:2211.10487
- **Early Release Science of the Exoplanet WASP-39b with JWST NIRCам,**
Ahner, E-M., The JWST Transiting Exoplanet Community Early Release Science Team et al., 2022 arxiv:2211.10489
- **Early Release Science of the Exoplanet WASP-39b with JWST NIRISS,**
Feinstein, A.D., The JWST Transiting Exoplanet Community Early Release Science Team et al., 2022 arXiv:2211.10493
- **Direct Evidence of Photochemistry in an Exoplanet Atmosphere,**
Tsai, S-M., The JWST Transiting Exoplanet Community Early Release Science Team et al., 2022 arXiv:2211.10490
- **Identification of carbon dioxide in an exoplanet atmosphere,**
The JWST Transiting Exoplanet Community Early Release Science Team 2022, Nature
- **Importance of Sample Selection in Exoplanet Atmosphere Population Studies,**
Batalha, N. E., Wolfgang, A., Teske, J., Alam, M. K., Alderson, L., Batalha, N. M., López-Morales, M., Wakeford, H. R., 2022, ApJ
- **LRG-BEASTS: ground-based detection of sodium and a steep optical slope in the atmosphere of the highly inflated hot-saturn WASP-21b,**
Alderson, L., et al. 2020, MNRAS, 497, 5182