

Chloe Elizabeth Fisher

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INTERESTS

I am working on developing atmospheric retrieval methods involving machine learning techniques for extrasolar planets. I use both high- and low-resolution data, and also study the theory of transmission spectra. I aim to use machine learning to analyse multiple datasets simultaneously and consider three-dimensional effects.

Key words: *Exoplanet atmospheres, machine learning, Bayesian inference*

EMPLOYMENT

University of Oxford, UK SNF Mobility Fellow	06/2022 - 06/2024
University of Bern, Switzerland Scientific Researcher	09/2021 - 06/2022

EDUCATION

University of Bern, Switzerland PhD in Astrophysics, summa cum laude	08/2017 - 09/2021
University of Cambridge, UK MSci., Natural Sciences, first class honours BA., Mathematics, upper second class honours	10/2012 - 06/2016

PUBLICATIONS

- Grimm, S.L., Malik, M., Kitzmann, D., Guzmán Mesa, A., Hoeijmakers, H.J., **Fisher, C.**, Mendona, J.M., Yurchenko, S.N., Tennyson, J., Alesina, F., Buchschacher, N., Burnier, J., Segransan, D., Kurucz, R.L., & Heng, K. 2021, ApJS, 253, 30
HELIOS-K 2.0 Opacity Calculator and Open-source Opacity Database for Exoplanetary Atmospheres
- Guzmán Mesa, A., Kitzmann, D., **Fisher, C.**, Burgasser, A.J., Hoeijmakers, H.J., Márquez-Neila, P., Grimm, S.L., Mandell, A.M., Sznitman, R., & Heng, K. 2020, AJ, 160, 15
Information Content of JWST NIRSpec Transmission Spectra of Warm Neptunes
- Fisher, C.**, Hoeijmakers, H.J., Kitzmann, D., Márquez-Neila, P., Grimm, S.L., Sznitman, R., & Heng, K. 2020, AJ, 159, 192
Interpreting High-resolution Spectroscopy of Exoplanets using Cross-correlations and Supervised Machine Learning
- Oreshenko, M., Kitzmann, D., Márquez-Neila, P., Malik, M., Bowler, B.P., Burgasser, A.J., Sznitman, R., **Fisher, C.**, & Heng, K. 2020, AJ, 159, 6
Supervised Machine Learning for Intercomparison of Model Grids of Brown Dwarfs: Application to GJ 570D and the Epsilon Indi B Binary System
- Fisher, C.**, & Heng, K. 2019, ApJ, 881, 25
How Much Information Does the Sodium Doublet Encode? Retrieval Analysis of Non-LTE Sodium Lines at Low and High Spectral Resolutions
- Hoeijmakers, H.J., Ehrenreich, D., Kitzman, D., Allart, R., Grimm, S.L., Seidel, J.V., Wyttenbach, A., Pino, L., Nielsen, L.D., **Fisher, C.**, Rimmer, P.B., Bourrier, V., Cegla, H.M., Lavie, B., Lovis, C., Patzer, A.B.C., Stock, J.W., Pepe, F.A., & Heng, K. 2019, A&A, 627, A165
A spectral survey of an ultra-hot Jupiter: Detection of metals in the transmission spectrum of KELT-9b
- Seidel, J.V., Ehrenreich, D., Wyttenbach, A., Allart, R., Lendl, M., Pino, L., Bourrier, V., Cegla, H.M., Lovis, C., Barrado, D., Bayliss, D., Astudillo-Defru, N., Deline, A., **Fisher, C.**, Heng, K., Joseph, R., Lavie, B., Melo, C., Pepe, F., Ségransan, D., & Udry, S. 2019, A&A, 623, A166
Hot Exoplanet Atmospheres Resolved with Transit Spectroscopy (HEARTS) - II. A broadened sodium feature on the ultra-hot giant WASP-76b
- Fisher, C.**, & Heng, K. 2018, MNRAS, 481, 4698
Retrieval analysis of 38 WFC3 transmission spectra and resolution of the normalization degeneracy
- Márquez-Neila, P., **Fisher, C.**, Sznitman, R., & Heng, K. 2018, Nature Astronomy, 2, 719
Supervised machine learning for analysing spectra of exoplanetary atmospheres

REFEREEING	Referee for ApJ Letters	02/2020-Present
FELLOWSHIPS & AWARDS	SNSF Postdoc.Mobility Fellowship	2022-2024
	SSAA MERAC Funding and Travel Award (4500 CHF)	2021
	University of Bern International 2021 PhD Fellowship	2017-2020
	Bundy Scholarship, University of Cambridge	2016
	Magdalene College Natural Sciences award, University of Cambridge	2016
PROFESSIONAL TALKS	<ul style="list-style-type: none"> • SSAA GA (Virtual) 10/2021 • ESO Atmo Conference (Virtual) 08/2021 • KPIC Mini workshop (Virtual) 06/2021 • Young Physicists Forum, Switzerland (Virtual) (Invited) 04/2021 • California Institute of Technology, California, USA (Virtual) (Invited) 09/2020 • University of Chicago Journal Club, Chicago, USA (Virtual) (Invited) 08/2020 • ESP Summer School, Bern, Switzerland (Virtual) 06/2020 • CSH Symposium, Bern, Switzerland 02/2020 • AMLD, Lausanne, Switzerland (Invited) 01/2020 • DPS, EPSC, Geneva, Switzerland 09/2019 • Junior Researchers Assembly, Vitznau, Switzerland 09/2019 • ESP Summer School, Lenzerheide, Switzerland 06/2019 • CSH Symposium, Bern, Switzerland 01/2019 • Machine Learning Series, Oxford, UK (Invited) 11/2018 • SPI-MAX, Oxford, UK (Invited) 11/2018 • Bern Exoplanet Retreat, Monte Verita, Switzerland 09/2018 • Spectroscopy of Exoplanets, Windsor, UK 07/2018 • DTU Workshop, Copenhagen, Denmark 05/2018 	
ORGANISATION	LOC & SOC for PlanetS Junior Researchers' Assembly	04/2022
	SOC for ESO Atmo 2021 Conference	08/2021
TEACHING	Mentor for visiting refugee high-school student University of Bern, Switzerland	09/2018 - present
	TA for Bachelor's Physics Exercises and Lab Courses University of Bern, Switzerland	2020-2021
	TA for Master's Course " <i>Advanced Statistical Methods for Physicists</i> " University of Bern, Switzerland	02-06/2019
	Physics A-level teaching assistant The Cherwell School, UK	05-07/2017
	Student mentor for Cambridge STEP school University of Cambridge, UK	04-06/2013; 08/2014

OUTREACH

Talk at A-Level certificates evening
The Cherwell School, UK

12/2019

Video for International Relations
University of Bern, Switzerland

11/2019

Talk at Pint of Science
Bern, Switzerland

05/2019