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 transimission 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*

EDUCATION

University of Bern, Switzerland — 08/2017 - present
PhD candidate in Astrophysics

University of Cambridge, UK — 10/2012 - 06/2016
MSci., Natural Sciences, first class honours
BA., Mathematics, upper second class honours

PUBLICATIONS

9. **Fisher, C.**, et al. *in prep*
Grid Sampling Requirements and Optimisation for Random Forest Exoplanet Atmospheric Retrieval
8. 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
7. **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
6. 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
5. **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
4. 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
3. 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
2. **Fisher, C.**, & Heng, K. 2018, MNRAS, 481, 4698
Retrieval analysis of 38 WFC3 transmission spectra and resolution of the normalization degeneracy
1. 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

FELLOWSHIPS AND AWARDS

University of Bern International 2021 PhD Fellowship — 2017-Present

Bundy Scholarship, University of Cambridge — 2016

Magdalene College Natural Sciences award, University of Cambridge — 2016

PROFESSIONAL TALKS

- University of Chicago Journal Club, Chicago, USA (Virtual) (Invited) 08/2020
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- ESP Summer School, Bern, Switzerland (Virtual) 06/2020
  "HELA"
- CSH Symposium, Bern, Switzerland 02/2020
  "High-Resolution Atmospheric Retrieval for Exoplanets"
- AMLD, Lausanne, Switzerland (Invited) 01/2020
  "Supervised Machine Learning for Exoplanet Atmospheric Retrieval"
- DPS, EPSC, Geneva, Switzerland 09/2019
  "Supervised Machine Learning for Analysing Spectra of Exoplanetary Atmospheres"
- Junior Researchers Assembly, Vitznau, Switzerland 09/2019
  "Supervised Machine Learning for Analysing Spectra of Exoplanetary Atmospheres"
- ESP Summer School, Lenzerheide, Switzerland 06/2019
  "HELA"
- CSH Symposium, Bern, Switzerland 01/2019
  "Supervised Machine Learning for Analysing Spectra of Exoplanetary Atmospheres"
- Machine Learning Series, Oxford, UK (Invited) 11/2018
  "Supervised Machine Learning for Analysing Spectra of Exoplanetary Atmospheres"
- SPI-MAX, Oxford, UK (Invited) 11/2018
  "Retrieval Analysis of WFC3 Transmission Spectra of Exoplanets"
- Bern Exoplanet Retreat, Monte Verita, Switzerland 09/2018
  "Supervised Machine Learning for Analysing Spectra of Exoplanetary Atmospheres"
- Spectroscopy of Exoplanets, Windsor, UK 07/2018
  "Supervised Machine Learning for Analysing Spectra of Exoplanetary Atmospheres"
- DTU Workshop, Copenhagen, Denmark 05/2018
  "Retrieval Analysis of WFC3 Transmission Spectra"

TEACHING

Mentor for visiting refugee high-school student 09/2018 - present
University of Bern, Switzerland

Physics lab assistant Spring 2020
University of Bern, Switzerland

Teaching assistant for "Advanced Statistical Methods for Physicists" Spring 2019
University of Bern, Switzerland

Physics A-level teaching assistant 05-07/2017
The Cherwell School, UK

Student mentor for Cambridge STEP school 04-06/2013; 08/2014
University of Cambridge, UK

OUTREACH

Talk at A-Level certificates evening 12/2019
The Cherwell School, UK

Video for International Relations 11/2019
University of Bern, Switzerland

Talk at Pint of Science 05/2019
Bern, Switzerland