

Oliver Hall, Ph.D.

ESA Research Fellow · Data Scientist · Astrophysicist

info

ojhall94@gmail.com ✉
github.com/ojhall94 🌐
asteronomer.com 🖱️
@asteronomer 🐦
(+31)(0)614227748 📞
Leiden, NL 📍
ORCID:
0000-0002-0468-4775

languages

Bilingual fluency in
English and **Dutch**

programming

Fluent: **Python**, SQL
Competent: HTML, MATLAB

tools

Python: NumPy, SciPy
pandas, **scikit-learn**
Stan, JAX, **Pyro**, PyMC
TensorFlow, Matplotlib
seaborn, **pytest**

Other: Jupyter
Google Colab, GitHub
Unix, Office365, ChatGPT

skills

Bayesian Statistics
AI/**Machine Learning**
Predictive Modelling
Open Source Development
Data Visualisation

Time-series analysis

Communication
Leadership, Mentoring
Critical Thinking
Problem Solving
Project Management

awards + hons

ESA Research Fellowship

Highly competitive fellowship
for independent research

Associate Fellow (AFHEA)

Formal acknowledgement of
teaching expertise

Royal Society Partnership Grant

Competitive £3000 grant for
school outreach programme

PhD in Astrophysics with a focus on **Bayesian statistics**, machine learning and high performance computational methods. Track record of finding **creative data-driven solutions** to open problems and delivering **actionable scientific results**. Thrives in a fast-paced, deadline-driven **collaborative environment**. 7 years experience in research of which 3 post-doctoral. Seeking new challenges and growth in data and industry. This CV is also available in a [plain text HTML format](#).

experience

- 2020→now **ESA Research Fellow** European Space Research and Technology Centre, NL
- Applying **Fourier Analysis**, **Gaussian Processes**, **Hierarchical Bayesian modelling** to **time-series data** using **PyMC3**, **Pyro**, **JAX**.
 - Providing statistical and scientific expertise to ESA staff scientists.
 - Designing, executing and disseminating novel research and its outcomes.
- 2020 **Freelance Software Developer** NumFOCUS, US
- Developing **training materials** for users of the NASA *Kepler* and K2 missions.
 - Integrating the open source package **Lightkurve** into the **Astropy** framework.

selected projects

Automated all-sky survey of stellar rotation in galactic structures

- Built open source program automating measurement of stellar rotation in 213 GB of data.
- Built a hierarchical latent variable model reporting 790 stellar membership probabilities of galactic structures used for follow-up observations and analysis by scientific community.

Advanced hierarchical models of stellar rotation in time-series data

- Used hierarchical models, Gaussian processes to measure rotation in 94 stellar periodograms.
- Performed model rejection between two hypotheses in 5-dimensional parameter space, providing critical new evidence that a contested theory of stellar evolution was 98% more likely than its alternative.

Modelling covariances of stellar properties in large standard-candle populations

- Developed generative hierarchical latent variable models of population of >5000 stars.
- Delivered detailed information about covariances in the population properties, leading to a 25% precision improvement of distance measurements calibrated using this population.

education

- 2016→2020 **Ph.D.** in Physics & Astronomy University of Birmingham, UK
- Developed novel Bayesian Models to determine stellar population properties.
 - Lead development on two modules of open source Python package **Lightkurve**, with >250k downloads and >400 citations.
- 2012→2016 M.Sci. in Physics & Astrophysics - **1st** w. Hons. University of Birmingham, UK
- 2006→2012 Gymnasium - 10 9s incl. Maths, Physics, English Gemeentelijk Gymnasium Hilversum, NL

other experience

- Collaborating:** worked on projects and in consortia in teams ranging from 3 to 80+ researchers.
- Speaking:** expert speaker for >20 academic conferences, seminars, public outreach events.
- Writing:** (co-)authored 18 scientific and 14 popular-science articles, receiving 850+ citations.
- Data presentation:** designed readable graphs, posters, presentations for experts and public.
- Peer review:** expert panel member for 2 scientific journals and 2 NASA funding programs.
- Teaching/Mentoring:** (co-)supervisor for 4 master's students, run knowledge workshops.
- Organising:** run 3 conferences, summer student program, fortnightly working group meetings.