Emily L. Hunt – Curriculum Vitae

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Research Profile

Astronomer with interests in machine learning and statistics. Highly skilled programmer with 10+ years of programming experience. During my Ph.D., I used Gaia data and various machine learning techniques to create the largest ever catalogue of star clusters in the Milky Way. I am looking to work on applications of machine learning to large astronomical datasets such as Gaia, Vera Rubin, and JWST surveys.

Education & Employment

2023 – 2024: Postdoctoral researcher, Heidelberg University

2023 – Ph.D. in Astronomy

Heidelberg University, Germany (IMPRS-HD Graduate School)
Thesis: "Improving the census of open clusters in the Milky Way with data from *Gaia*"
Advisor: S. Reffert

2019 – M.Phys. Physics with Astronomy

University of Bath, United Kingdom
Thesis: "Inference of photometric galaxy redshifts with a mixture density network"
Advisor: S. Wuyts

Publications

ADS search 🔗

3. **Hunt, Emily L.** and Reffert, Sabine (in prep.). "Improving the open cluster census. III. The masses and dynamics of open clusters in the Milky Way".

2. **Hunt, Emily L.** and Reffert, Sabine (2023). "Improving the open cluster census. II. An all-sky cluster catalogue with Gaia DR3". A&A, 673, A114

1. **Hunt, Emily L.** and Reffert, Sabine (2021). "Improving the open cluster census. I. Comparison of Clustering Algorithms applied to Gaia DR2 Data". A&A, 646, A104

Selected Presentations

NAM 2022 (Techniques 2) – The power (and caveats) of clustering algorithms with examples from use on Gaia data.

EAS 2022 (SS15) – The open cluster renaissance has only just begun: Exciting new insights from an all-sky Gaia EDR3 cluster census.

EAS 2022 (SS34)* – Name change policies in astronomy journals: How they were achieved and lessons we can learn.

EAS 2022 (SS24) – Approximate Bayesian neural networks with 'Flipout' weight perturbations.

LGBTQ+ STEMinar, 2022[+]– Ancestry in space: Looking for families of stars with machine learning.

Astronomy seminar, University of Hertfordshire, 2021* – An all-sky open cluster census with Gaia EDR3.

Star Clusters: The Gaia Revolution, 2021 – A more complete and accurate open cluster census with Gaia EDR3.

EAS 2021 (S32)* – Uncertainty in machine learning: are Bayesian neural networks viable in 2021?

EAS 2021 (S15) – A more complete and accurate open cluster census with Gaia EDR3.

Gaia group seminar, University of Vienna, 2021* – Searching for open clusters with Gaia.

* = invited; [+]= outreach.

Workshops Attended

CZS school on Scientific Machine Learning in Astrophysics, Heidelberg, 2023

GaiaUnlimited Community Workshop, Heidelberg, 2022

dotdotAstronomy, 2022

Awards

University of Bath IMI Undergraduate Research Internship (funded), 2018
Project: De-reddening Cepheid variable stars with a Bayesian inference method
Advisor: V. Scowcroft
Funding: £2000

Teaching & Supervision

Astronomy Lab Course, Heidelberg University, 2021
Introduction to Astronomy I, Heidelberg University, 2020
Co-supervisor of MSc student, 2020-2021

Community Service

Conferences and workshops

SOC for .Astronomy 12, New York (2023)
Led session on open cluster selection functions at GaiaUnlimited 2022

Open-source software

Developing a new open cluster analysis Python package for publication in 2023
Developer of astronomy community feeds on Bluesky social network

Relevant expertise

Programming languages

Python: expert (e.g. numpy, tensorflow, emcee)
C/C++: intermediate
JavaScript: intermediate (Svelte, SvelteKit)
Java: basic

Tools and scripting languages

Git/GitHub: expert
LaTeX: expert
HTML/CSS: intermediate
ADQL/SQL: basic

Languages

English: native speaker
German: intermediate