

Emma Lofthouse, PhD

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Skills

Python

- Pandas, NumPy, astropy

Machine Learning

- scikit-learn, TensorFlow, Keras

Data visualization

- Matplotlib, seaborn

Git Version control

LaTeX

SQL, IDL

Courses

Machine Learning Specialization

(Andrew Ng, Coursera)

- Supervised Machine Learning:

Regression and Classification

- Advanced Learning Algorithms

- Unsupervised Learning,

Recommenders, Reinforcement Learning

ing

Teaching

Postgraduate Python course (Durham)

Postgraduate course on Numerical Methods (Durham)

Undergraduate Lab demonstrator (Durham, Hertfordshire)

Undergraduate Mathematics

(Hertfordshire)

Communication

16 academic papers (6 First Author)

Topics including data preparation, statistics and analysis.

Academic presentations at numerous institutions and conferences world-wide including the General Assembly of the International Astronomical Union and the UK National Astronomy Meetings.

Science Outreach including talks, planetarium shows and observatory tours.

Recent Activity

Completed a personal challenge to walk the length of the UK from Land's End to John O'Groats (2200km).

Experience

UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA | POSTDOCTORAL RESEARCHER

May 2020 - April 2023 | Milan, Italy

- During this position, I was responsible for developing a sequence classification model using random forest to identify and model features in galaxy spectra. This model was successful at identifying up to 90% of features, comparable to human classification, but was able to complete the work in hours rather than months.
- I also completed one of the first statistically significant studies connecting gas and galaxies in the distant Universe by analysing datasets containing thousands of galaxies using correlation, regression and clustering methods.

UNIVERSITY OF DURHAM | POSTDOCTORAL RESEARCHER

May 2018 - April 2020 | Durham, UK

- As the scientific lead of the MAGG survey, I managed the data science pipeline to process, clean and distribute large datasets of astronomical data.
- Utilising this data, I explored individual cases in detail to identify low signal-to-noise features and showed that the nature of gas around galaxies is much more complex and diverse than previously thought.

UNIVERSITY OF HERTFORDSHIRE | PHD RESEARCHER

Sept 2013 - Sept 2017 | Hatfield, UK

- While a PhD candidate, I focused on exploiting and combining very large datasets from multiple major telescopes. I used data mining techniques (e.g. SQL) to clean and extract information in order to study the distribution of star formation and make inferences about the nature of galaxies and how they evolve.
- I showed that mergers between two comparable galaxies, while dramatic, are rare and have little impact on the overall evolution of our Universe.

Education

PHD IN ASTROPHYSICS 2017 | University of Hertfordshire

"On the processes that drive stellar mass growth and morphological transformation over cosmic time"

Supervisor: Dr. Sugata Kaviraj

MPHYS PHYSICS 2013 | University of Warwick

First Class with honours