

# Ted Mackereth, Ph.D.

PhD in Astrophysics with focus on statistics, machine learning and high performance computational methods. Natural problem solver and generalist. 3 years experience in post-doctoral research and senior data science, thrives in fast-paced, deadline-driven environments, seeking new challenges and growth in data and industry.

✉ [tedmackereth@gmail.com](mailto:tedmackereth@gmail.com)

🐙 @jmackereth

🐦 @ted\_mackereth

🏠 [ted.mackereth.xyz](http://ted.mackereth.xyz)

## EXPERIENCE

### Senior Data Scientist

📅 2022 - Present

📍 *OceanMind, Harwell Campus, Oxfordshire, UK*

- Management level role conducting research and development of new IP at a non-profit company in the maritime conservation and enforcement sector.
- Supporting development and maintenance of a cutting-edge ML engine that applies **speech recognition tech (C++, C#, Azure)** to detect and characterise fishing activities from vessel **satellite imaging** and telemetry to prevent illegal, unregulated and unreported fishing and provide intelligence on other maritime activities.

### Banting, CITA and Dunlap Postdoctoral Fellow

📅 2020 - 2022

📍 *Canadian Institute for Theoretical Astrophysics, University of Toronto, Canada*

- Nationally funded independent researcher in galactic astrophysics overseeing a broad range of solo and collaborative projects using large scale **hydrodynamical simulations** and **multi-dimensional observational data** sets (through SQL), applying **Bayesian modelling** and **machine learning** techniques with **PyTorch**, **Pyro** and **scikit-learn**

### Galactic Archaeology Postdoctoral Fellow

📅 2019 - 2020

📍 *School of Astronomy & Astrophysics, University of Birmingham, UK*

- Providing expertise on galaxy evolution to a stellar astrophysics group
- Applying **Fourier Analysis**, **Gaussian Process models**, **Hierarchical Bayesian modelling** to **time-series data** using **PyMC3**, **Stan**, **Keras**

## PROJECTS

### Artificial Neural Networks for age-dating 400,000 stars

- Developed pipelines and Bayesian CNN models for fast and reliable prediction of ages in 400,000 stars from high-dimensional spectroscopic data

### Advanced Bayesian models of the structure of the Milky Way

- Applied inhomogeneous spatial Poisson point process models to make detailed maps of the structure of our Galaxy from incomplete and noisy data

### Inferring and visualising fishing activity from satellite data

- Supported the late stage development of an algorithm employing a viterbi decoder to parse fishing vessel satellite telemetry (AIS), to infer fishing activity for global fishing fleets.

## EDUCATION

### PhD, Astrophysics

📅 2015 - 2019

📍 *Astrophysics Research Institute, Liverpool John Moores University, UK*

- Developed novel algorithm for determining orbits of stars in the Milky Way

### MPhys, Astrophysics

📅 2011 - 2015

📍 *University of Liverpool, UK*

- Graduated 1st Class w/ Honours. Courses included statistics, computational physics, dynamics

## LANGUAGES

### FLUENT

python SQL

### COMPETENT

R Julia C/C++ MATLAB

## TOOLS

Numpy Scipy scikit-learn

PyTorch Pyro Keras PyMC

TensorFlow BigQuery

plotly/Dash Matplotlib

Figma Google Cloud

GDAL/QGIS

## SKILLS

Statistics AI/ML

Data Visualisation

Geospatial Data

Time-series analysis

Communication Mentoring

Leadership Critical Thinking

Problem Solving

Project Management

## CODE CONTRIBUTION

### galpy

Galactic dynamics package in Python with C/C++ extensions

### apogee

Python toolkits for astrophysical data from SDSS/APOGEE

## AWARDS & HONOURS

### Thesis Prize

2019 LJMU Faculty of Engineering Thesis Prize

### Banting Postdoctoral Fellowship

One of Canada's most competitive postdoctoral awards

### James Webb Space Telescope

Lead a proposal which was awarded some of the first observing time

## INTERESTS

Design Architecture Hiking

Open Science/Data Art