Conor MacBride

🌐 macbride.me | 🔗 conormacbride | ⦿ ConorMacBride

An astrophysics PhD student and open source software maintainer based in Belfast. Through my doctoral research and open source contributions I have experience architecting, developing, testing and maintaining software applications. I am keen to commence a new software engineering role where I can utilise and expand my skills by working on exciting and beneficial projects.

EDUCATION

QUEEN'S UNIVERSITY BELFAST
PHD PHYSICS
Expected graduation September 2022

Energy Dissipation in Solar Physics

Created a software package for extracting velocity measurements from observations of the Sun, utilising machine learning techniques. Worked with multithreaded HPC simulations, and managed and analysed large volumes of data. Multiple publications in peer-reviewed journals.

Astrophysics Research Centre, School of Mathematics and Physics

UNIVERSITY OF ST ANDREWS
MPHYS (HONS) MATHEMATICS AND THEORETICAL PHYSICS
Grad. June 2019 | Scotland, UK

First-class honours

Deans' List – 2015/16, 2016/17, 2017/18, 2018/19

ST COLUMB'S COLLEGE
A-LEVELS
Grad. June 2015 | Northern Ireland

• Physics **A**
• Mathematics **A***
• Further Mathematics **A***
• Music **A***
• Chemistry *(AS only)* **B**
GCSEs: 6 A*, 4 A & 1 B

Peer Mentor and Prefect

SKILLS

TECHNICAL
Python • Unix • Bash • Git • CI/CD • HTML • CSS
Familiar:
Java • JavaScript • Fortran 90 • Docker • C • SQL

PROFESSIONAL
• Attention to detail
• Problem-solving
• Communication
• Project management
• Learning new skills
• Technical writing

OTHER INTERESTS
• Supporting open source projects
• Trombone **Grade 8 Distinction**
• University of St Andrews Big Band | **Sep 2015 – May 2019**
• Hillwalking

EXPERIENCE

SUNPY | CONTINUOUS INTEGRATION MAINTAINER
Nov 2021 – Present | Remote

• Maintaining the CI/CD pipelines across various platforms including Azure Pipelines, GitHub Actions and CircleCI, and investigating and recommending new CI services.
• Configuring Python testing environments and ensuring unit tests are sufficient.
• Implementing new functionality, as well as fixing bugs and optimising existing code.
• Reviewing pull requests to maintain a high-quality, well-tested codebase.

Contributions to the ecosystem

• Maintain the OpenAstronomy Azure Pipelines templates, GitHub Actions workflows and `build-python-dist` action, which are relied upon by other projects, including AstroPy.
• Significant improvements to Matplotlib's `pytest-mpl` plugin, including,
  – a new test suite, and infrastructure, to validate the internal state of the plugin across a wide range of configurations, and
  – HTML summary reports with interactive filtering of the image comparison test results. These reports are used by popular Python packages including NetworkX and Cartopy.

QUEEN'S UNIVERSITY BELFAST | TEACHING ASSISTANT
Sep 2019 – Present | Belfast, Northern Ireland

• Secured funding to host a Software Carpentry workshop for postgraduate researchers within the School of Mathematics and Physics.
• Supporting and guiding students in the level-one Computational Physics course as they solve problems using Python. Most of the students are new to programming.
• Marking and providing feedback on assignments for the level-two Mathematical Physics course.

INITIATIVE FOR INTERSTELLAR STUDIES | WEB EDITOR
Jan 2018 – Present | London, England [Remote]

• Keep online content up-to-date and enhance its presentation.
• Manage content creation for the organisation's membership scheme and assist with the scheme's technical implementation. This involves participating in, and occasionally chairing, teleconferences and email discussions with project stakeholders around the world.
• Implement custom features into the website using PHP and document extensively. This allows routine tasks to be automated.
• Provide advice and assistance on procuring service contracts and on business matters.

UNIVERSITY OF ST ANDREWS | SOLAR PHYSICS SUMMER STUDENT
May 2018 – Jul 2018 | St Andrews, Scotland

- I spent six weeks working in the Solar and Magnetospheric Theory group within the School of Mathematics and Statistics under the supervision of Prof. Alan Hood.
- My research project involved exploring the magnetohydrodynamics equations in the context of the Sun, investigating how a magnetic field behaves in the presence of a non-constant Alfvén speed, which introduces the process of phase mixing.

HUMBOLDT UNIVERSITY OF BERLIN | STUDENT INTERN
Jun 2017 – Aug 2017 | Berlin, Germany

- Spent three months during Summer 2017 working on a project involving using a convolutional neural network to detect, from videos, fish swimming on the surface of sulfur water.
- Wrote a program that takes the fish detected by the neural network and connects the fish across frames in the video. It then filters out poor quality detections by setting a minimum number of frames a chain of detections has to be present in before it is considered to be a fish.
- My program significantly improved the reliability of the output from the neural network. This was proven by comparing the filtered detections with the detections from the neural network using annotated ground truth frames.
- Studied neural networks and retrained the existing neural network with new training data and different training parameters. I created multiple models then analysed their accuracy to find the optimal parameters.
- Used the Linux command line extensively and created Bash scripts to automate many tasks. Developed my skills using `git` and `vim`.

UNIVERSITY OF ST ANDREWS PHYSICS SOCIETY | St Andrews, Scotland
TREASURER | May 2018 – Apr 2019
PUBLICITY OFFICER | May 2016 – May 2018

- Worked closely with other committee members to boost attendance at events. Anticipated their needs and took initiative, designing and distributing posters and other media prior to events.
- Adapted my schedule when old projects changed and when new projects started.
- Built responsive website with member and events management system using HTML, CSS, PHP, SQL and iCalander as well as Slack and Mailchimp integrations to allow the committee to manage the society better. Used Google Analytics to monitor traffic and assess effectiveness of website content. Made adjustments accordingly.
- Co-founded and produced a science podcast, managing the technical aspects including the website, radio station, emails, RSS feed and editing and mastering the raw audio. Analysed email and website click-through rates to boost listening figures. I personally interviewed guests on occasions.
- Assisted with funding applications by recommending new podcasting equipment as well as participating in interviews for society awards. The society won 2nd most innovative society in St Andrews in 2017 primarily for the podcast.
- Implemented new advertising strategies including advertising through a Snapchat Geofilter and digital displays. Improved the society's social media presence by migrating to a Facebook Page.

CERN | STUDENT INTERN
Jul 2014 | Geneva, Switzerland

Shadowing the Head of Operations and colleagues in the Beams Department. In September 2013, I was a CERN Mini Expo Guide explaining particle physics to primary and secondary school students in my city.