Fred Cook

fred@fredcook.co.uk
github.com/fuverdred

EDUCATION

PhD Physics *University of Bristol* **2016-Present**
Thesis submitted December 2020, awaiting viva date.
Title: *Development of Apparatus for Ice Nucleation Studies.*

The fundamentals of what makes a good ice nucleator remain poorly understood at the nanoscale. In my PhD I developed three experimental methods:

- A novel way of automating a standard experimental technique (published).
- An updated version of an automated lag time apparatus (ALTA) for ice nucleation studies.
- An environmental chamber for freezing acoustically levitated water droplets.

Some relevant highlights of my PhD work include:

- A program for detecting freezing droplets from a series of images, including tracking the movement of the droplets, written in Python using OpenCV.
- Reverse engineering the instruction set for a picolitre droplet printer, allowing a custom labVIEW program integrated with an X-Y translation stage to be written.
- Python scripts for cleaning, analysing and graphing data using standard scientific libraries (NumPy, SciPy and Matplotlib).
- Programmed microcontrollers (Arduino and pyBoard) to read peripherals and control experiments.

MSci Physics *University of Bristol* **2012-2016**
First class Honours

Alleyn's School **2005-2012**
A-levels: Physics A*, Maths A*, Economics A (AS-level Politics A)
GCSEs: 6A*, 3A, 1B

SOFTWARE DEVELOPMENT SKILLS

Python 3 Four years of experience.
Well versed in the standard scientific libraries: **NumPy**, **SciPy**, **Matplotlib**.
Personal projects include web-scraping scripts, a tool for creating themed crosswords and a device for monitoring and controlling the pH of soil.

Misc. Experience programming in C, knowledge of git and LaTeX

PUBLICATIONS

- Cook et al., *A pyroelectric thermal sensor for automated ice nucleation detection.* (2020) Atmos. Meas. Tech. Disc. 13, 2785–2795
- Cook et al., *An updated automated lag-time apparatus for ice nucleation studies.* Awaiting submission.