

# Colin Clarke

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## EDUCATION

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### **St. Mary's Diocesan Secondary School**

*Achieved over 500 points in the Leaving Cert Examinations*

Drogheda, Louth, Ireland

*Sep. 2013 → Jun 2018*

### **BA in Physics and Astrophysics from Trinity College Dublin**

*Achieved first class honours*

Dublin, Ireland

*Sep. 2018 → Apr 2022*

## EXPERIENCE

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### **Science Communicator with the Travelling Telescope**

*Nairobi, Kenya*

Sep. 2022 → Nov. 2022

- Travelled to Kenya to work with the Travelling Telescope, a social enterprise dedicated to sharing the wonders of the universe with as many people as possible.
- Over 2 months, I visited 14 schools, spread throughout Kenya, with an array of high-end amateur astronomy equipment, and a mobile, inflatable planetarium. Acted as a guide to the equatorial night-sky at a number of safari lodges and boarding schools.
- at 02:14 27/10/22, the team successfully observed the DART impact with 2 out of 3 of our telescopes. We observed a dramatic brightening, and a large cloud of ejecta spread through the Didymos system. My presence before, during and after the event was vital to this success.
- Coordinated with NASA and ESA in the observation of DART, the Double Asteroid Redirection Test, from a remote part of Kenya. Now Co-author on the paper “Characterizing the Effects of the DART Impact on Dimorphos with the Unistellar Network”, recently submitted to Nature.
- Assisted in the running of shows in the Nairobi planetarium. This involved presenting shows, giving live demonstrations of night-sky navigation, and answering questions from the audience.

### **Secretary of the Trinity Space Society**

*Trinity College Dublin*

Sep 2020 → Apr 2022

- Liaise with science communicators and academics worldwide in order to organize fun and enriching events for our members.
- Create weekly email newsletters including details of the last week's events, information regarding upcoming ones and segments on interesting news in the fields of Cosmology and astronomy.
- Negotiated the sponsorship and subsequent purchase of a powerful amateur telescope and observational equipment valued at > £1700 for the society at no cost to the society itself.
- Successfully oversaw the alteration of the society's constitution in alignment with a request made by the central society's commission.
- Communicated time, date and location of each meeting with appropriate notice to each committee member and created the items on the agenda for each meeting, taking diligent and detailed minutes during said meetings.
- Produced the crucial annual secretary's report detailing the nature of each meeting and society event during the academic year and the attendance at each. This report functions as the succession report for the subsequent secretary.

### **Research Assistant DCU**

*Remote*

May. 2020 → Aug. 2020

- Under the supervision of Dr Masha Chernyokova of Dublin City University, studied LSI +61°303, a particularly interesting source of gamma-ray radiation in the constellation Cassiopeia
- Used archival data collected by the Large Area Telescope(LAT) instrument on the Fermi space telescope to demonstrate the GeV source exhibiting signs of super-orbital modulation, implying the existence of a compact binary system.
- Took part in weekly remote meetings with my supervisor and her research team, including postdocs and PhD students who each assisted greatly with my project
- Installed and implemented the Fermi-LAT Python Analysis Framework, FermiPy. Functioning on a configuration-file driven workflow in which the analysis parameters (data selection, IRFs, and ROI model) are defined in a YAML configuration file, the software featured a range of tools for manipulation of the fermidata.

## PROJECTS

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### **Flappy Bird AI** | *Python, PyGame, Pytorch,*

June 2019 → Apr 2020

- Successfully developed an AI that indefinitely played the game Flappy Bird using a genetic neural network that utilizes a fitness function to systematically mutate and mate the most successful networks in order to obtain an optimal model.

### **Handwritten Digit Classifier** | *TensorFlow, Keras, Pillow, MNIST, Git*

May 2018 → July 2018

- Expanded on the canonical classification problem using Pygame, by allowing a user to input their own digit and have the model predict its value. Project featured an artificial neural network with cross entropy loss function and image processing.

### **Exoplanet detection using Machine Learning** | *TensorFlow, Keras, Kaggle Git*

August 2018 → September 2018

- Utilized a Support Vector Machine(SVM) to sweep through the brightness of thousands of stars as a function of time, pinpointing periodic dips in the data that likely corresponded to exoplanets orbiting said star. Applied data reduction techniques to de-noise and obtained model that identified exoplanets with reasonable success despite a heavily imbalanced dataset.

## HOBBIES/VOLUNTEERING/BUSINESS

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### **Samaritans Listening Volunteer**

August 2020 → Present

- Successfully interviewed and trained with the Samaritan's listening service that provides 24/7 access to those who need someone to listen. The core goal of the Samaritan is that less people die by suicide and this is something I can get behind whole-heartedly.

### **Hobbies**

- Hobbies include programming games such as PianoTiles for myself, solving the Rubik's Cube, chess, athletics, lock-picking, skydiving, playing the piano, card magic, juggling, reading.

### **Online Grinds Business**

- During the working week, I teach junior and leaving cert science, physics and mathematics at both the higher and ordinary level. This is an enriching activity and allows me to simultaneously share my knowledge and hone my teaching and communication skills.