QIAORONG YU

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EDUCATION

MMathPhys, University of Oxford, UK **Oct 2021 – Jun 2025 (Expected)**
Guanghua Cambridge International School, China **Sep 2018 – Jun 2021**

HONORS & AWARDS

- Four **Undergraduate Project Grants** received from Balliol College, Oxford 2022 – 2024
- **Reynolds Scholarship** received from Balliol College, Oxford 2023
- **Prosser Exhibition** received from Balliol College, Oxford 2022
- **Distinction** in first year Physics preliminary exams 2022
- British Physics Olympiad Round One Top Gold 2020
- Silver and Bronze Duke of Edinburgh Award 2020

RESEARCH EXPERIENCE & INTERNSHIPS

Massachusetts Institute of Technology, Vogelsberger lab, USA **Jan 2024 -Ongoing**
Undergrad researcher

- Investigating factors affecting the splashback radius and the splashback features of dark matter halos using cosmological galaxy formation simulations IllustrisTNG and MillenniumTNG.
- Independently solved technical issues on remote servers, including remote visualization, parallel computing, job submission, etc.
- Proficient in programming in linux terminal and using ssh, git, screen related commands.
- Proficient skills in analyzing astrophysics simulation data using package, e.g., h5py, Astropy, in python, bootstrapping and other statistical methods.
- Manuscript in preparation.

University of Oxford, Staresina lab, UK **Feb 2024 -Ongoing**
Undergrad researcher

- Investigating the memory transformation during sleep by analyzing the changes in lower and higher-level visual representations of memories pre- and post-sleep by comparing the performance of various visual and semantic deep neural networks (DNNs), including Alexnet, ResNet, BLIP, CLIP, GPT, etc, and correlating sleep and memory retention by electroencephalogram (EEG) analysis on both Python and Matlab.
- Assisting in data collection and analyzing within the group, including EEG setup and localization, fMRI preprocessing and MVPA, and diffusion MRI analysis and modeling.

University of Montreal, Dream engineering lab, Canada **May 2023 - Oct 2023**
Undergrad researcher

- Attempted using EEG to decode visual dream content by leveraging an encoding model which generates EEG signals from pretrained deep neural networks on natural images.
- Accumulated skills including EEG preprocessing, extracting visual feature maps, representative similarity analysis (RSA) and permutation tests via Python (MNE, scikit-learn)
- Poster presented in Cognitive Neuroscience Society (CNS) Annual Conference in 2024.

Oxford University, Department of Physics, UK
Undergrad project in exoplanets **Jan 2023 – Mar 2023**

- Conducted independent exoplanet project: Radial Velocity Method of Finding Exoplanet, focusing on measuring orbital parameters of exoplanets 51 Peg b and hd80606 b, as part of second year physics course in Oxford.
- Manually implemented optimization, curve fitting, Lomb-Scargle periodogram and Markov Chain Monte Carlo (MCMC) algorithms to simulate and to fit radial velocity data to determine planetary parameters via Python (Astropy). Both circular and eccentric orbits are successfully analyzed.

ROVR System, Oxford University Micro Internships, UK
Internship in 3D modeling **Mar 14th, 2022 – Mar 18th, 2022**

- Created 3D sceneries in Endless Running using Unreal Engine 4.27. Improved both game engineering skills in Unreal Engine and art design skills, including designing meshes, modifying textures and adding lightings, etc.
- Presented well time management ability and anti-stress ability during the short and intense internships and demonstrated the project to employers by exporting and performing the Endless running via VR helmet.

CORE COURSES

- First year: Classical Mechanics, Linear Algebra, Calculus, Differential Equations, Functions of a Complex Variable, Basic Statistics
- Second year: Mathematics Methods, Statistical Mechanics, Electromagnetism and Optics, Quantum Mechanics
- Third year: Special Relativity and Symmetry, General Relativity and Cosmology, Atomic and Laser Physics, Nuclear and Particle Physics, Solid State Physics, Numerical Methods

OTHER EXPERIENCE

Oxford University, Comprehensive Oxford Mathematics and Physics Online School (COMPOS)
Tutor **Nov 14th, 2022 – May 1st, 2023**

- Led six UK high school students in weekly physics and mathematics sessions which are beyond A-Level syllabus. Marked students' assignments and provided feedback.
- Co-ordinated with other COMPOS tutors to improve the lesson plan and teaching structure.

Oxford University Pistol Club, UK
Secretary & Committee member **Mar 2023 – June 2024**

- Arranged club events, e.g., regular training sessions, varsity competitions and freshers' fair.

- Active communications with Rifle Associations in Britain and Home Office.

Oxfam[1], UK *Volunteer* **Apr 2023 – May 2024**

- Assisted in the operation of charity shops every weekend, including cashiering, ironing donated clothes, organizing shelves, running the online store and sorting second-hand records and CDs.
- Worked with elderly people in the UK to cultivate communication and cooperation skills among people with different cultural backgrounds and enhanced social service awareness.

COMPUTATIONAL SKILLS

- **Python**: proficient in using numpy, pandas, scipy, matplotlib, pytorch, Image, scikit-learn (machine learning), h5py (large dataset process), Astropy (astrophysics), MNE (neurophysiological data analysis), mpi4py (parallel computing) and Qiskit (quantum computing).
- **Shell**: proficient in working on remote server in Unix/Linux systems via ssh, including job submission, organizing Python environment (conda) and parallel computing.
- **Matlab**: Proficient in data visualization, numerical methods and correlational analysis.
- **Unreal Engine**: basic knowledge in 3D graphics and scene design.
- **VS Code, Git, LaTeX**, **Mathematica,**

SKILLS & INTERESTS

Languages: English, Chinese, French (A1)
Interests: painting, instrument (Pipa), pole dance, MMA, movies & science fictions