Taotao Yang

Master of Science in Astrophysics | Bachelor of Science in Physics

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Address: 112 Mavisbank Gardens, Glasgow, G51 1HR, Glasgow, United Kingdom

Education

University of Glasgow — Glasgow, United Kingdom

`Master of Science in Astrophysics` — `Sep. 2022 - Dec. 2023`

- Thesis: Exploring the space of gravitational wave signals with machine learning
- Supervisor: Dr. John Veitch

Georgia Institute of Technology — Atlanta, United States

`Bachelor of Science in Physics` — `Aug. 2017 - Dec. 2021`

- Concentration: Astrophysics
- Minor: Sustainable Cities, International Affairs

Projects in Physics

Exploring the space of gravitational wave signals with machine learning — Glasgow, United Kingdom

`Institute for Gravitational Research, University of Glasgow` — `May. 2023 - Sep. 2023`

- Develop JAX based python packages for template bank density calculation
- Achieve 5-10 ms template density calculation with continued integration
- Investigate normalizing flows with JAX to approximate generated densities

Data Analysis Projects — Glasgow, United Kingdom

`University of Glasgow` — `Jan. 2023 - Apr. 2023`

- Develop NumPy based scripts to format, filter, and visualize microwave radio emission data
- Employ MCMC, Metropolis, and Bayesian statistics for fitting mock data entries

Modern Optics Laboratory — Atlanta, United States

`Georgia Institute of Technology` — `Jan. 2021 - May. 2021`

- Design, install, and align optic table experiment apparatus
- Perform measurements using digital multimeter and oscilloscope for laser diodes
- Execute data collection and analysis with IGOR and MATLAB concerning beam profiles

Cosmology Computational Project — Atlanta, United States

`Georgia Institute of Technology` — `Aug. 2020 - Dec. 2020`

- Performed numerical integration with NumPy for Distance - Redshift relation
- Presented talk on cosmic distance ladder and its relation with supernova cosmology project

Advanced Laboratory — Atlanta, United States

`Georgia Institute of Technology` — `May. 2020 - Aug. 2020`

- Recreate Cavendish experiment with laser mounted torsion balance
- Recreate Davisson-Germer experiment using electron diffraction apparatus
- Calculate the electron charge-mass ratio using data collected by Tracker
- Analyse data on Hall effect experiment to determine the property of Hall probes
- Analyse data on single and double slit interference to demonstrate particle-wave duality
- Verify the Fraunhofer's equation and the validity of de Broglie's matter wave theory

Stellar Characteristics Project on 2.0 Solar Mass Star — Atlanta, United States

`Georgia Institute of Technology` — `Jan. 2020 - May. 2020`

- Calculate mass-luminosity, luminosity-radius, temperature-radius, and pressure-radius relations
- Compare the structural and surface difference between Sol and 2.0 solar mass star
- Analyse core volume/mass to star volume/mass ratio
- Analyse PP & PPI chains and CBN cycles of 2.0 solar mass star and its luminosity and magnitudes
- Conduct comparative analysis on main sequence lifetime between theory and observations

Experience

Teaching Assistant — Atlanta, United States
Georgia Institute of Technology — Aug. 2021 - Dec. 2021

- Provided teaching assistance for Modern Optics Laboratory course
- Provided grading and revisional comments on lab reports

Research Assistant — Hangzhou, China
Zhejiang Sci-Tech University — Aug. 2016 - Feb. 2017

- Explored methods of modelling airframe using SolidWorks
- Designed and patented a novel model of v-tail quadcopter
- Used 3-D printing and soldering to develop the quadcopter

Assistant Curator — Ningbo, China
TEDxNingbo — Oct. 2016 - Jun. 2017

- Provide logistical and marketing support for annual TEDxYouth event
- Coordinate local student band to perform and give talk on TEDxYouth event
- Assist with manuscript and video subtitle translations

Advanced Physics & Astronomy Courses

Advance Laboratory	General Relativity	Radio & Optical Instrument
Advanced Data Analysis	Gravitational Wave Detection	Solar Atmosphere
Classical Mechanics	Modern Optics Lab	Solar System
Cosmology	Nonlinear Dynamics & Chaos	Statistical Mechanics
Electro & Magnetostatics	Pulsar & Supernova	Stellar Astrophysics
Electrodynamics	Quantum Mechanics	Thermodynamics

Language, Software, and Skills

Language

- Chinese (Mandarin, Bilingual), English (Bilingual)

Scientific Computing

- Python (NumPy, SciPy, JAX, Matplotlib), Linux (Ubuntu), Git, Jupyter
- Mathematica, LaTeX, GitHub

Additional Skills

- Scientific Writing, Attention to Detail, Public Speaking
- Photography, CaptureOne, Lightroom, Darktable, Blender, SolidWorks, Saxophone

Honors & Awards

Faculty Honors — Fall, 2021; Spring, 2021; Summer, 2020
Dean's List — Fall, 2020; Spring, 2020