Qiao Duan

Curriculum Vitae

University of Cambridge
Kavli Institute of Cosmology
The Cavendish Laboratory
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[Personal Website]

EDUCATION

University of Cambridge, Ph.D in Physics — October 2024 - October 2028
1st Year PhD student specializing in Extragalactic Astronomy and Early Universe Research using JWST data. Research focuses on Galaxy Stellar Populations, and Star Formation Properties, Spectral Energy Distribution (SED) fitting, and Galaxy Mergers.

The University of Manchester, MPhys(Hons) Physics with Astrophysics — September 2020 - June 2024
Astrophysics Student with Courses in: Galaxies, Stars and Stellar Evolution, Exoplanets, Gravitation, Early Universe, Cosmology, Quantum Mechanics, Electrodynamics, Optics, Statistical Mechanics, Nuclear and Particle Physics, Nonlinear Physics
First Class Honour Degree

RESEARCH EXPERIENCE

Galaxy Stellar Population and SED fitting — October 2024 - Present
Superviosr: Professor Sandro Tacchella

- Investigating Galaxy Stellar Mass functions by developing a forward-modelling Bayesian approach.
- Developing a new version of the Prospector SED fitting code — `Prospector-`γ

High-redshift Galaxy Mergers with JWST — September 2023 - October 2024
Superviosr: Professor Christopher Conselice

- Developed a Statistically Rigorous Method for Selecting Galaxy Mergers in the Early Universe
- Analysis of Merger Evolutions, including Pair Fractions, Merger Rates, Mass Accretion Rate, and Morphology

High-redshift Galaxy Star Forming Properties with JWST — June 2023 - September 2023
Superviosr: Professor Christopher Conselice

- NIRCam Photometry and NIRSpec Spectral Data Analysis; Comparative Studies of Properties Derived from Both Techniques
- Stellar Population, Star Forming, and Dust properties analysis
- Parametric and Non-Parametric star formation history Spectral Energy Distribution (SED) Fitting
- Morphology Analysis

Pulsar Research Project — October 2022 - December 2022

- Observing Pulsars using 76-m Lovell Telescope and the 42-ft Radio Telescope at Jodrell Bank Observatory
- Performing De-dispersion, time-of-arrival corrections, pulsar timing and pulsar surface magnetic field analysis

TELESCOPE PROPOSALS

- 2 JWST Cycle 4 Proposals — Principal Investigator
- 4 JWST Cycle 4 Proposals — Co-Investigator
- 1 JWST Cycle 3 Proposal — Co-Investigator
- COSMOS LOFAR 2.0 Proposal: Exploring COSMOS with LOFAR's Eyes (ECOLE) — Co-Investigator

PROGRAMMING SKILLS

- **Language:** Python (6 years of experience)
- **Astronomy Libraries:** `Astropy`, `Bagpipes`, `Specutils`, `LMFIT`, `Galfit`, `Prospector`, `EAZY`, `LePhare`, `Photutils`
- **Simulation and Model:** JAGUAR Simulation, TNG50 Simulation, Semi-analytic forecasts for JWST Simulation, FLARES Simulation, WebbPSF Simulation, `Cloudy` Model
- **Data Manipulation and Analysis Tools:** `Numpy`, `SciPy`, `scikit-learn`, `Pandas`, `emcee` (MCMC), `dynesty` + `Nautilus` (nested sampling)
- **Others:** TOPCAT, Aladin, ds9, Mathematica, Unreal Engine, LaTeX

WORK EXPERIENCE

DIGITWIN Technologies, Shanghai, Technical Marketing — June 2021 - September 2021

- Performing Machine Learning and Deep Learning algorithms for market analysis
- PEST analysis, Data gathering

ST UK Education, Physics and Maths tutor — July 2020 - Present

- Tutoring A-Levels and IB students on Physics, Maths, and Further Maths
- Two lessons every week

ADDITIONAL SKILLS AND INTERESTS

Piano: Grade 8 (ABRSM), Level 10 (China Conservatory of Music)
Fencing: Ranked 44th in Unprofessional Chinese Fencing club Competition
League of Legends: Ranked 198th in Chinese Server (Season 6)

LEAD-AUTHOR PUBLICATIONS

1) **Qiao Duan**, Christopher J. Conselice, Qiong Li, Thomas Harvey, Duncan Austin, James Trussler, Nathan Adams; *Galaxy Mergers in the Epoch of Reionization I: A JWST Study of Pair Fractions, Merger Rates, and Stellar Mass Accretion Rates at $z = 4.5$ - 11.5* [Link]
Status: Published by MNRAS, Citation = 34

2) **Qiao Duan**, Christopher J. Conselice, Qiong Li, Thomas Harvey, Duncan Austin, Katherine Ormerod, James Trussler, Nathan Adams; *Adding Value to JWST Spectra and Photometry: Stellar Population and Star Formation Properties of Spectroscopically Confirmed JADES and CEERS Galaxies at $z > 7$* [Link]
Status: Published by MNRAS, Citation = 13

3) **Qiao Duan**, Christopher J. Conselice, Qiong Li, Thomas Harvey, Duncan Austin, James Trussler, Nathan Adams; *Galaxy Mergers in the Epoch of Reionization II: Major Merger-Triggered Star Formation and AGN Activities at $z = 4.5$-8.5* [Link]
Status: Published by MNRAS, Citation = 9