Qiao Duan

Curriculum Vitae

University of Cambridge
Kavli Institute of Cosmology
The Cavendish Laboratory
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EDUCATION

University of Cambridge, Ph.D in Physics — October 2024 - October 2028
1st Year PhD student specializing in Extragalactic Astronomy, Early Universe, and Supermassive Black Hole research using JWST data. Research focuses on galaxy mergers, stellar populations, and star formation properties.

The University of Manchester, MPhys(Hons) Physics with Astrophysics — September 2020 - June 2024
4th Year Astrophysics Student with Physics courses in: Quantum Mechanics, Electrodynamics, Optics, Statistical Mechanics, Nuclear and Particle Physics, Nonlinear Physics, Galaxies, Stars and Stellar Evolution, Exoplanets, Gravitation, Early Universe and Cosmology.
Current grades: 80/100 (UK Grading System)[1], GPA: 3.95/4.0 (US Grading System)

Dulwich International High School Suzhou, High School Diploma — 2017-2020
A-Levels: Maths(A*), Physics(A), Further Math(A*), Economics(A*)

RESEARCH EXPERIENCE

High-redshift Galaxy Mergers with JWST — September 2023 - Present
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

- JWST Cycle 3 Proposal; Second Co-Investigator
- COSMOS LOFAR 2.0 Proposal - Exploring COSMOS with LOFAR's Eyes (ECOLE); Co-Investigator

PROGRAMMING SKILLS

- **Language:** Python (4 years of experience, including four long projects.)
- **Astronomy Libraries:** `Astropy`, `Bagpipes`, `Specutils`, `LMFIT`, `Galfit`, `Pypher`, `EAZY`, `LePhare`, `Photutils`

[1] Equivalent to a First Class honours in the UK grading system

- **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)
- **Others:** TOPCAT, Aladin, ds9, Mathematica, Unreal Engine, LaTeX

PUBLICATIONS

1) **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 = 6

2) **Qiao Duan**, Christopher J. Conselice, Qiong Li, Thomas Harvey, Duncan Austin, James Trussler, Nathan Adams; *Galaxy Mergers in the Epoch of Reionization: JWST Insights from* $z > 6$ [Link]
Status: In Preparation, Plan to submit to MNRAS on June

3) **Qiao Duan**, Christopher J. Conselice, Qiong Li, Thomas Harvey, Duncan Austin, James Trussler, Nathan Adams; *Cosmic Collisions: Unveiling the Impact of Merger Activities on Galaxy Properties at* $z > 6$ *with JWST*
Status: In Preparation, Plan to submit to MNRAS on June

4) Qiong Li, Christopher J. Conselice, **Qiao Duan**, Thomas Harvey, Duncan Austin, James Trussler, Nathan Adams; *Discovery of a dual AGN at* $z = 5.5$ *using JWST, MUSE and ALMA*
Status: In Preparation, Plan to submit to MNRAS on June

5) Kwan Lin Kristy Fu, C. J. Conselice, Leonardo Ferreira, Thomas Harvey, **Qiao Duan**, Nathan Adams, Duncan Austin; *Predicting Dust Extinction Measures for* $z \sim 8$ *Galaxies using Machine Learning on JWST Imaging.*
Status: Submitted to MNRAS

6) Thomas Harvey, C. J. Conselice, Nathan Adams, Duncan Austin, James Trussler, Katherine Ormerod, Qiong Li, **Qiao Duan** et al.; *EPOCHS IV: Consistency of Stellar Masses and the Stellar Mass Function at* $6.5 \leq z \leq 13.5$.
Status: Submitted to ApJ

7) Qiong Li, C. J. Conselice, Florian Sarron, Thomas Harvey, Duncan Austin, **Qiao Duan**, Nathan Adams, James Trussler; *EPOCHS X: Protocluster Galaxies at* $4.5 < z < 10$ *in CEERS, JADES, and NEP from JWST observations.*
Status: Submitted to MNRAS

8) Duncan Austin, Christopher J. Conselice, Nathan J. Adams, Thomas Harvey, **Qiao Duan**, James Trussler, Qiong Li et al.; *EPOCHS III: Unbiased UV continuum slopes at* $6.5 < z < 13$ *from combined PEARLS GTO and public JWST NIRCam imaging.*
Status: Submitted to ApJ

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)