

Nicholas Choustikov

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Nationality: British, New Zealander

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Interests

Galaxy formation and evolution, magnetohydrodynamics, high-energy astrophysics, AGN feedback, black holes, simulation forward modelling, reionization, large-scale structure and cosmology

Education

DPhil in Astrophysics

Oriel College, University of Oxford

PhD program

October 2022 - Present

Supervisors: Professor Julien Devriendt and Professor Adrienne Slyz

Thesis title: The impact of magnetic fields on gas accretion onto supermassive black holes and AGN feedback: the next frontier of galaxy formation cosmological simulations

BA + MSci in Natural Sciences

Fitzwilliam College, University of Cambridge

Undergraduate program

October 2018 - July 2022


Grade: Double First Class with Distinction (85%, ranked 3rd)

Masters Supervisors: Dr Zvonimir Vlah and Professor Anthony Challinor


Courses: Astrophysical Fluid Dynamics, General Relativity, Black Holes, Galaxy Formation, Cosmology, Modern Stellar Dynamics, Quantum Field Theory, Field Theory in Cosmology

First-Author Papers


The Great Escape: On the Connection Between Ly α Emission and LyC Escape in Simulated JWST Analogues 2024

Nicholas Choustikov, Harley Katz, Aayush Saxena, Thibault Garel, Julien Devriendt, Adrienne Slyz, Taysun Kimm, Jeremy Blaizot, and Joki Rosdahl 
Submitted to MNRAS

The Physics of Indirect Estimators of Lyman Continuum Escape and their Application to High-Redshift JWST Galaxies 2023


Nicholas Choustikov, Harley Katz, Aayush Saxena, Alex Cameron, Julien Devriendt, Adrienne Slyz, Joki Rosdahl, Jeremy Blaizot, and Leo Michel-Dansac 
Submitted to MNRAS

Optimizing the Evolution of Perturbations in the Λ CDM Universe 2023


Nicholas Choustikov, Zvonimir Vlah, and Anthony Challinor 
Published in Phys. Rev. D

Contributed Papers

The sizes of bright Lyman-break galaxies at $z \simeq 3 - 5$ with JWST PRIMER 2024

Rohan Varadaraj, Rebecca Bowler, Matt Jarvis, Nathan Adams, **Nicholas Choustikov**, Anton Koeke-moer, Adam Carnall, Derek McLeod, James Dunlop, Callum Donnan, and Norman Grogan 
Submitted to MNRAS

The Sphinx Public Data Release: Forward Modelling High-Redshift JWST Observations with Cosmological Radiation Hydrodynamics Simulations 2023

Harley Katz, Joki Rosdahl, Tayun Kimm, Jeremy Blaizot, **Nicholas Choustikov**, Marion Farcy, Thibault Garel, Martin Haehnelt, Leo Michel-Dansac, and Pierre Ocvirk 

Conferences

National Astronomy Meeting - Cardiff University	2023
<i>Talk: The Physics of Lyman Continuum Escape from High-Redshift JWST Galaxies</i>	
RAMSES User Meeting - University of Oxford (LOC)	2023
<i>Talk: Towards a General Framework of LyC Escape Fraction Diagnostics</i>	

Teaching

CP1: Classical Mechanics	2023 - present
<i>1st year undergraduate tutorials at Oriel College, Oxford</i>	
A3: Quantum Mechanics	2023 - present
<i>2nd year undergraduate tutorials at Oriel College, Oxford</i>	
B2: Symmetry and Relativity	2023 - present
<i>3rd year undergraduate tutorials at Oriel College, Oxford</i>	

Academic Internships

Kavli Institute for Cosmology, University of Cambridge	Summer 2022
<i>Project: Loop-order corrections to the dark matter power spectrum with quintessence dark energy</i>	
<i>Supervisors: Dr Zvonimir Vlah and Professor Anthony Challinor</i>	
Mullard Space Science Laboratory, University College London	Summer 2021
<i>Project: Simulating QCD phase transitions in binary neutron star mergers</i>	
<i>Supervisor: Professor Kinwah Wu</i>	
AMOP Group, University of Cambridge	Summer 2019
<i>Project: Designing and building a long-lasting millisecond optical shutter</i>	
<i>Supervisors: Dr Timon Hilker and Professor Zoran Hadzibabic</i>	

Awards and Societies

Graduate Teaching and Research Scholarship - Oriel College	2023 - present
<i>Research funding in exchange for teaching undergraduate physics students at Oriel College</i>	
STFC Long Term Attachment Grant	2023
<i>Funding for a 5 month research attachment to Princeton with Professor Romain Teyssier</i>	
STFC Stipend	2022 - 2026
<i>Full PhD stipend plus course fees for 3.5 years</i>	
1912 Senior Scholarship + Foundation Scholarship	2022
<i>Award for achieving a first class result in each year of the undergraduate course</i>	
Ronald Walker Scholarship + Rawlins Prize	2021
<i>Award for best computational project</i>	
Elected Fellow of the Royal Astronomical Society (FRAS)	2020

Other Experience

Men's Captain of Cambridge University Eton Fives Club	2020 - 2021
<i>Organised COVID-19-safe return to play policies for the club</i>	
<i>Oversaw and coached in safe training sessions for experienced and beginner players</i>	
<i>Organised safe travel and participation for players in Universities/National tournaments</i>	
<i>Organised and oversaw a successful and COVID-19-secure Varsity match</i>	

Self-Run Research Project

2020

Simulating binary black hole mergers with the Einstein Toolkit
Published: The Einstein Toolkit: A Student's Guide

Secretary of Cambridge University Eton Fives Club

2019 - 2020

Liaised with other clubs to organise fixtures for both the Mens' and Ladies' Clubs
Coached players of all standards at University and College clubs

Technical skills

Programming Languages	Python, Mathematica, Fortran, Bash, MATLAB, L ^A T _E X, MPI parallel programming
Software/Tools	RAMSES, Einstein Toolkit, High-Performance Computing, VisIT, Microsoft Office
Other Languages	Trained to operate class 3B & 4 lasers, proficient solderer English (<i>native</i>), Russian (<i>fluent</i>), French (<i>intermediate</i>), German (<i>basic</i>)