

# Nicholas Choustikov

✉ nicholas.choustikov@physics.ox.ac.uk ☎ +44 7512 647 717

*Nationality:* British, New Zealander

📍 Denys Wilkinson Building, Keble Road, Oxford, OX1 3RH



## Interests

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

## Education

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### 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

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**The Great Escape: On the Connection Between Ly $\alpha$  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  $\Lambda$ CDM Universe** 2023

*Nicholas Choustikov, Zvonimir Vlah, and Anthony Challinor*


Published in *Phys. Rev. D* 


## Contributed Papers

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**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 Koekemoer, Adam Carnall, Derek McLeod, James Dunlop, Callum Donnan, and Norman Groggin*

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*   
*Published in the Open Journal*

## Conferences

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**National Astronomy Meeting - Cardiff University** 2023  
*Talk: The Physics of Lyman Continuum Escape from High-Redshift JWST Galaxies*

**RAMSES User Meeting - University of Oxford (LOC)** 2023  
*Talk: Towards a General Framework of LyC Escape Fraction Diagnostics*

## Teaching

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**CP1: Classical Mechanics** 2023 - present  
*1st year undergraduate tutorials at Oriel College, Oxford*

**A3: Quantum Mechanics** 2023 - present  
*2nd year undergraduate tutorials at Oriel College, Oxford*

**B2: Symmetry and Relativity** 2023 - present  
*3rd year undergraduate tutorials at Oriel College, Oxford*

## Academic Internships

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**Kavli Institute for Cosmology, University of Cambridge** Summer 2022  
*Project: Loop-order corrections to the dark matter power spectrum with quintessence dark energy*  
*Supervisors: Dr Zvonimir Vlah and Professor Anthony Challinor*

**Mullard Space Science Laboratory, University College London** Summer 2021  
*Project: Simulating QCD phase transitions in binary neutron star mergers*  
*Supervisor: Professor Kinwah Wu*

**AMOP Group, University of Cambridge** Summer 2019  
*Project: Designing and building a long-lasting millisecond optical shutter*  
*Supervisors: Dr Timon Hilker and Professor Zoran Hadzibabic*

## Awards and Societies

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**Graduate Teaching and Research Scholarship - Oriel College** 2023 - present  
*Research funding in exchange for teaching undergraduate physics students at Oriel College*

**STFC Long Term Attachment Grant** 2023  
*Funding for a 5 month research attachment to Princeton with Professor Romain Teyssier*

**STFC Stipend** 2022 - 2026  
*Full PhD stipend plus course fees for 3.5 years*

**1912 Senior Scholarship + Foundation Scholarship** 2022  
*Award for achieving a first class result in each year of the undergraduate course*

**Ronald Walker Scholarship + Rawlins Prize** 2021  
*Award for best computational project*

**Elected Fellow of the Royal Astronomical Society (FRAS)** 2020

## Technical skills

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**Programming Languages**

Python, Mathematica, Fortran, Bash, MATLAB, L<sup>A</sup>T<sub>E</sub>X, MPI parallel programming

**Software/Tools**

RAMSES, Einstein Toolkit, High-Performance Computing, VisIT, Microsoft Office

**Other**

Trained to operate class 3B & 4 lasers, proficient solderer

**Languages**

English (*native*), Russian (*fluent*), French (*intermediate*), German (*basic*)