

# Nicholas Choustikov

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*Place of birth:* Auckland, New Zealand *Date of birth:* 10th June 1999

📍 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, astrophysical tests of gravity, reionization, large-scale structure and cosmology

## Education

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### DPhil in Astrophysics

*Mansfield 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*

## Publications

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### 1. Optimizing the Evolution of Perturbations in the $\Lambda$ CDM Universe

2023

*Nicholas Choustikov, Zvonimir Vlah and Anthony Challinor*



*Submitted to Phys. Rev. D*

### 2. 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*

### 3. The Einstein Toolkit: A Student's Guide

2020

*Nicholas Choustikov*



*Published on arXiv*

## 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*

## Conferences

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- RAMSES User Meeting- University of Oxford** 2023  
*Talk: Towards a General Framework of Escape Fraction Diagnostics*
- **Organisation:** Part of LOC, Ran IT for the event
- National Astronomy Meeting - Cardiff University** 2023  
*Talk: The Physics of Lyman Continuum Escape from High-Redshift JWST Galaxies*

## Awards and Societies

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- 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

## Other Experience

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

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| <b>Programming Languages</b> | Python, Mathematica, Fortran, Bash, MATLAB, L <sup>A</sup> T <sub>E</sub> X, MPI parallel programming         |
| <b>Software/Tools</b>        | RAMSES, Einstein Toolkit, High-powered computing, VisIT, Microsoft office                                     |
| <b>Other</b>                 | Trained to operate class 3B & 4 lasers, proficient solderer   |
| <b>Languages</b>             | English ( <i>native</i> ), Russian ( <i>fluent</i> ), French ( <i>intermediate</i> ), German ( <i>basic</i> ) |

## References

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**Prof. Julien Devriendt,**  
University of Oxford  
Sub-department of Astrophysics  
DWB, Keble road, OX1 3RH Oxford, UK  
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**Prof. Adrienne Slyz,**  
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**Prof. Andrew Jardine,**  
University of Cambridge  
Mott Building, Cavendish Laboratory  
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