NICHOLAS CHOUSTIKOV

1st year DPhil Student striving to better simulate universes
I'm interested in studying both *small* scales (magnetised gas accretion onto black holes and active galactic nuclei (AGN) feedback) and *large* scales (reionization and perturbation theory of large scale structure) using a variety of numerical and analytical techniques

CONTACT

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- ⓘ 0000-0002-7973-5442
- NASA/ADS publication list

SKILLS

Programming
Python	●●●●●
Fortran	●●●●○
C++	●●●○○
Bash	●●●○○
MATLAB	●●●○○
LaTeX	●●●●○
Mathematica	●●●●○

Software & Tools
RAMSES	●●●●○
Einstein Toolkit	●●●○○
HPC	●●●●○
DIaL3, Cosma8, AWS,...	
Visualisation	●●●●●
(e.g. matplotlib, VisIt, ...)	
Data handling/analysis	●●●●●
(e.g. numpy, scipy, pandas, ...)	
Microsoft Office	●●●●●

Operating Systems
Linux	●●●●●
MacOS	●●●●○
Windows	●●●●○

Unrelated technical skills
Trained to operate class 3B & 4 lasers
Proficient solderer

Languages
English	●●●●●
Russian	●●●●●
French	●●●○○
German	●●●○○

OTHER INTERESTS

Eton Fives (sport)
Oxford Half Blue: 2023; Cambridge Half Blue: 2022, 2021, 2020, 2019; London Plate winner 2022; Kinnaird Festival winner 2021
Squash (sport)
Oxford Cuppers winner 2023, Cambridge Cuppers finalist 2019, Represented University of Cambridge
Photography

🎓 EDUCATION

📅 10/2022 - Present
📍 University of Oxford
Mansfield College
DPhil in Astrophysics
Supervisors: Professor Julien Devriendt and Professor Adrianne Slyz
Funding: Full STFC Studentship

📅 09/2018 - 07/2022
📍 University of Cambridge
Fitzwilliam College
BA + MSci in Natural Sciences
Grade: First Class with Distinction (85%)
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

» **Optimizing the Evolution of Perturbations in the ΛCDM Universe (*in prep.**)**
👥 **N. Choustikov**, Z. Vlah and A. Challinor

» **The Physics of Indirect Estimators of Lyman Continuum Escape and their Application to High-Redshift JWST Galaxies (*submitted to MNRAS*)**
👥 **N. Choustikov**, H. Katz, A. Saxena, A. J. Cameron, J. Devriendt, A. Slyz, J. Rosdahl, J. Blaizot and L. Michel-Dansac

» **The Einstein Toolkit: A Student's Guide (2020)**
👥 **N. Choustikov**
*Draft available on request

⚙ RESEARCH EXPERIENCE

📅 10/2022 - Present
📍 Department of Physics, Oxford
DPhil Research
Title: **The impact of magnetic fields on gas accretion onto supermassive black holes and AGN feedback: the next frontier of galaxy formation cosmological simulations**
» Building sub-grid models of magnetised AGN in RAMSES.
» Post-processing cosmological simulations to study reionization.

📅 06/2022 - 09/2022
📍 Dr. Z. Vlah, IoA, Cambridge
Kavli Research Internship
» Extended Masters' research to include quintessence models of dark energy.

📅 06/2021 - 09/2021
📍 Prof. Kinwah Wu, MSSL, UCL
Summer Research Internship
» Simulated a binary neutron star merger to study the propagation of QCD phase transitions.

📅 06/2020 - 09/2020
📍 Personal Project
Summer Research Project
» Taught myself to simulate binary black hole mergers using the Einstein Toolkit on AWS.

🏅 AWARDS AND SOCIETIES

🏆 1912 Senior Scholarship + Foundation Scholarship – *2022*

🏆 Rawlins Prize (best computational project) – *2021*

🏆 Elected Fellow of Royal Astronomical Society (FRAS) – *2020*

REFERENCES

- 👤 Professor Julien Devriendt
- 👤 Professor Adrianne Slyz
- 👤 Professor Anthony Challinor