Richard Stiskalek: Curriculum Vitae

CONTACT INFORMATION

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NASA ADS: h-index = 6, total citations = 110 (February 14, 2025)

INTERESTS

Local Universe reconstructions, peculiar velocities, semi-analytic galaxy formation models, galaxy dynamics, galaxy–halo connection, strong field lensing of gravitational waves

EDUCATION

University of Oxford, Balliol College, Astrophysics DPhil — 2022 – 2026 (expected)
Thesis: "Testing the local Universe with constrained cosmological simulations"
Supervised by *Harry Desmond*, *Julien Devriendt*, and *Adrianne Slyz*

Ludwig-Maximilians-Universität München, Physics M.Sc. — 2020 – 2022
Thesis: "Frequency- and polarization-dependent lensing of gravitational waves in strong fields"
Supervised by *Miguel Zumalacárregui*, *Marius A. Oancea* and *Jochen Weller*[1]

Hong Kong University of Science and Technology — 2017 – 2018
Undergraduate Exchange Programme

University of Glasgow, Physics with Astrophysics B.Sc. — 2016 – 2020
Thesis: "Gravitational-wave cosmology"

EMPLOYMENT

Flatiron Institute, Center for Computational Astrophysics — 2025
Supervised by *Shy Genel* and *Lucia A. Perez*

Max Planck Institute for Gravitational Physics, Observational Relativity and Cosmology — 2020
Supervised by *Collin Capano*

University of Oxford, Sub-department of Astrophysics — 2019
Supervised by *Harry Desmond*

University of Glasgow, Institute for Gravitational Research — 2018
Supervised by *John Veitch* and *Chris Messenger*

PUBLICATIONS

[1] "The Velocity Field Olympics: Assessing velocity field reconstructions with direct distance tracers", **R. Stiskalek**, H. Desmond, J. Devriendt, A. Slyz, G. Lavaux, M. Hudson, D. Bartlett, H. Courtois [arXiv:2502.00121]

[2] "Symmetry in Hyper Suprime-Cam galaxy spin directions", **R. Stiskalek**, H. Desmond [Res. Notes AAS 8 281, arXiv:2410.18884]

[3] "Inferring the Ionizing Photon Contributions of High-Redshift Galaxies to Reionization with JWST NIRCam Photometry", N. Choustikov, **R. Stiskalek**, A. Saxena, H. Katz, J Devriendt, A. Slyz [arXiv:2405.09720]

[4] "Evaluating the variance of individual halo properties in constrained cosmological simulations", **R. Stiskalek**, H. Desmond, J. Devriendt, A. Slyz [MNRAS 534:3120, arXiv:2310:20672]

[5] "Probing general relativistic spin-orbit coupling with gravitational waves from hierarchical triple systems", M. A. Oancea, **R. Stiskalek**, M. Zumalacárregui. [MNRAS 535:L1, arXiv:2307.01903]

[6] "On the fundamentality of the radial acceleration relation for late-type galaxy dynamics", **R. Stiskalek**, H. Desmond [MNRAS 525:6130, arXiv:2305.19978]

[7] "Frequency- and polarization-dependent lensing of gravitational waves in strong gravitational fields", M. A. Oancea, **R. Stiskalek**, M. Zumalacárregui [Phys. Rev. D 109, 124045, arXiv:2209.06459]

[8] "The scatter in the galaxy–halo connection: a machine learning analysis", **R. Stiskalek**, D. J. Bartlett, H. Desmond, D. Anbajagane [MNRAS 514:4026, arXiv:2202.14006]

[1] Internal thesis advisor

[9] "The dependence of subhalo abundance matching on galaxy photometry and selection criteria", **R. Stiskalek**, H. Desmond, T. Holvey, M. G. Jones [MNRAS 506:3205, arXiv:2101.02765]

[10] "Are stellar-mass binary black hole mergers isotropically distributed?", **R. Stiskalek**, J. Veitch & C. Messenger [MNRAS 501:970, arXiv:2003.02919]

Teaching experience

MPhys C1 Astrophysics, University of Oxford, Astrophysics — 2023 – 2024
Tutoring of cosmology, stellar astrophysics, and galaxies

Lumiere Education — 2023 – present
Mentorship of senior high school students conducting a research project

Practical Course - 3rd year, University of Oxford, Astrophysics — 2023
Astrophysics computational practical course demonstrator

Student supervision

Joshua Darne (MPhys, Oxford), — 2024 –
"Radial acceleration relation in the NewHorizon hydrodynamical simulation" (w/ T. Yasin & H. Desmond)

Fedir Boreiko (BSc, Manchester) — 2024
"The correlation between light and dark matter across cosmic time" (w/ T. Yasin & H. Desmond)

Enoch Ko (BSc, Warwick) — 2024
"Dark matter and galaxy dynamics: enduring puzzles" (w/ T. Yasin & H. Desmond)

Catherine Spencer (MPhys, Oxford), — 2023 – 2024
"The influence of cosmic environment on galaxy properties" (w/ T. Yasin & H. Desmond)

James Harvey (BSc, Oxford) — 2023 – 2024
"Machine learning the time of last major merger from spectroscopic data" (w/ T. Yasin & H. Desmond)

Selected Awards and Scholarships

Snell Exhibition, Balliol College — 2022 - 2026
STFC PhD Funding, Science and Technology Facilities Council — 2022 - 2026
DAAD Study Scholarship, German Academic Exchange Service — 2021 - 2022
Kerr Bursary, University of Glasgow — 2020
Lang Scholarship, University of Glasgow — 2019
Undergraduate Summer Bursary, Royal Astronomical Society — 2018
Dean's List, Hong Kong University of Science and Technology — 2018
Astronomy 1 Prize, University of Glasgow — 2017
Matthew A Muir Bursary, University of Glasgow — 2017
South East Asia Study Abroad Scholarship, University of Glasgow — 2017 - 2018

Service

Referee for *A&A*, *ApJ*, *MNRAS*, *PNAS*, *PRD* — 2022 – present
Aquila Consortium Oxford Meeting local organiser — 2023
Aquila Consortium Monthly Telecon organiser — 2023 – present
Organiser of "Middle of Scotland Science Festival" — 2018

Skills

Programming languages
- Python, Julia, Mathematica, C, C++, Fortran, Bash and others

Software
- RAMSES, Gadget, AREPO, Rockstar, DisPerSe, MPI, git, TensorFlow, JAX, PyTorch, LaTeX and others

Languages
- English, Czech, Slovak, French (intermediate), German (beginner)

Selected Talks

Velocity Field Olympics — 2025
Center for Computational Astrophysics

Velocity Field Olympics — 2025
Cosmic Flows 2025, Brisbane

Velocity field of the local Universe — 2024
University of Portsmouth

Search for the optimal dark matter halo density profile 2023
University of Oxford
Is the radial acceleration relation a fundamental correlation? 2023
University of Oxford
Frequency and polarisation dependent propagation of gravitational waves 2022
University of Glasgow
Frequency and polarisation dependent propagation of gravitational waves 2022
Ludwig-Maximilians-Universität München
Frequency and polarisation dependent propagation of gravitational waves 2022
Max Planck Institute for Gravitational Physics, Potsdam
The scatter in the galaxy–halo connection 2022
Baryon Pasters Collaboration meeting
The scatter in the galaxy–halo connection 2021
Ludwig-Maximilians-Universität München
Reversible-jump MCMC in gravitational-wave astronomy 2020
Max Planck Institute for Gravitational Physics, Hannover
Are binary-black hole mergers isotropically distributed? 2020
LIGO Scientific Collaboration Data Analysis telecon
The relation between galaxies and dark matter halos 2019
University of Oxford