

Dr. JAMES R. BEATTIE

updated: 27-May-2024

PERSONAL INFORMATION

NATIONALITY: · Australia · New Zealand
POSITIONS: · Joint Princeton & CITA Postdoctoral Fellow in astrophysical plasmas
EMAIL: · james.beattie@princeton.edu · jbeattie@cita.utoronto.edu
Online Profiles · [Google Scholar](#) · [ResearchGate](#) · [OrcID](#) · [Twitter](#)
INTERESTS: · MHD / HD turbulence · structure of the interstellar medium · star-formation
· high-performance computing · theoretical astrophysics · magnetic fields
· cosmic ray propagation · plasma/fluid dynamics · shocks · turbulent dynamo
· computer vision techniques · statistical modelling · interdisciplinary research

EDUCATION

2024 **Doctor of Philosophy**, Australian National University, Australia
Specialisation: Computational / theoretical astrophysics, magnetohydrodynamics.
Thesis: The statistics of magnetised interstellar turbulence
Advisor: Christoph Federrath

2019 **Honours (First Class)**, Australian National University, Australia
Major: Astrophysics
Thesis: Supersonic Turbulent Molecular Clouds: Filaments and Anisotropies
(with University Medal, Chancellor's Commendations, Bok Prize)

2018 **Bachelor of Mathematics**, Queensland University of Technology, Australia
Major: Applied and Computational Mathematics

2018 **Bachelor of Science**, Queensland University of Technology, Australia
Major: Physics

2013 **Bachelor of Education**, Queensland University of Technology, Australia
Major: Biology & Computing

Exchange and Summer Programmes

2022-23 Fulbright Exchange at the University of California, Santa Cruz, United States
2017-18 Cross Institutional Exchange at the University of Queensland, Australia
WINTER 2017 Summer Science Programme at The University of Cambridge, United Kingdom
FALL 2015 Exchange Semester at Simon Fraser University, Canada

SCHOLARSHIPS, AWARDS & GRANTS

Selected Scholarships & Fellowships

2023 CITA Fellow, CITA
2023 Research Associate, Princeton University
2023 Stanford Science Fellow, Stanford (declined)
2022 Fulbright PhD Fellowship
2020 [Joan Duffield Research Supplementary Scholarship](#)
2020 [Deakin PhD Scholarship](#)
2020 [Dean's Merit \(theoretical physics\) HDR Supplementary Scholarship](#)
2019 [Bok Honours Astrophysics Scholarship](#)

Selected Significant Awards

2020 [Chancellor's Letter of Commendation: 7.0/7.0 Honours GPA](#)
2020 [ASA Bok Prize: Best Astronomy Honours Thesis in Australia](#)
2020 Best Student Talk at [ANITA](#), 2020
2019 [University Medal](#) (top in graduating science cohort)
2018 Admission to the Dean's List of Students with Excellent Academic Performance
2018 [Vice Chancellor's Performance Award](#)
2018 [Nominated for 2018 Vice-Chancellor's Awards for Excellence](#)
2016 [Vice Chancellor's Performance Award: Best Sessional Teaching in Science & Engineering Faculty](#)

- 2016 Admission to the Dean's List of Students with Excellent Academic Performance
- 2015 Admission to the Dean's List of Students with Excellent Academic Performance
- 2014 Admission to the Dean's List of Students with Excellent Academic Performance

Computing grants awarded (1 core hour \approx \$0.13)

- | | | |
|------|--|------------------|
| 2022 | (PI) LRZ large scale call extension | 1.5e7 core hours |
| 2021 | (PI) LRZ large scale call: The world's largest compressible MHD simulation | 7e7 core hours |

Competitive Grants Awarded (PI / CO-PI)

- 2021 (CO-PI) Australian Capital Territory Summer Holiday Grant, Inspire ACT
- 2020 (CO-PI) Australian Capital Territory National Science Week Grant
- 2020 (PI) SSAP Grant for Mt Stromlo Student Seminars, 2020

Selected Minor Awards

- 2018 Joint funding from the [ANU](#) and [QUT](#) to present at the Australian Institute of Physics (AIP) Congress, 2018
- 2017 [GHD](#) Groundwater Modelling Award for Best Overall Group Submission
- 2017 Financial Sponsorship from the CPME and Mathematical Science School for the Cambridge Summer Science Programme
- 2017 Recipient of [QUT's](#) International short-term mobility bursary
- 2015 Recipient of [QUT's](#) International Bursary
- 2014 Best Paper Finalist | Australasian Conference on Robotics and Automation

Selected non-professional awards

- 2023 [Astro. Plot of the Week](#) (Figure 3)
- 2022 [Astro. Plot of the Week](#) (Figure 1)

PROFESSIONAL ACTIVITIES & ORGANISATION AFFILIATIONS

Professional Referee Activities

- (2 articles) Astrophysical Journal
- (3 articles) Monthly Notices of the Astronomical Society
- (1 article) Publications of the Astronomical Society of the Pacific
- (first call 2024) LRZ SuperMUC-NG large-scale compute project calls

Other Professional Activities

- 2023-present Coordinator for the Canadian Institute of Astrophysics Astro-Plasma Group
- 2022 [MSATT program](#) – connecting scientists with high school students
- 2022 Sustainability Committee, Member, [RSAA](#)
- 2021 Higher Degree Research Education Representative, [RSAA](#)
- 2021 Giving Committee, Member, [RSAA](#)
- 2020 President of the [RSAA](#) Student Seminar Committee
- 2019 ASTR4004, [ANU](#) Course Student Representative
- 2019 ASTR6007, [ANU](#) Course Student Representative
- 2014-16 [QUT's STIMULATE](#) Learning Support, Peer Learning Facilitator

Organisation Affiliations

- 2020 - PRES. Astronomical Society of Australia, student member
- 2014-18 [QUT](#) Physics Society, founding president
- 2016 [QUT's](#) Science Student as Partners, physics representative.
- 2016 [UQ's](#) Student as Partners, Fellow
- 2015 [Australian Institute of Physics](#), QLD Branch, [QUT](#) representative

SUPERVISIONS & MENTORING

Supervisions

- 2023 **Student:** Louis Burnaz (co-supervised w. Bart Ripperda), Undergrad. Student
Institute: École normale supérieure de Lyon
Project: Compression-triggered fast reconnection in relativistic, resistive MHD
- 2023 **Student:** Shashvat Varma (co-supervised w. Bart Ripperda), Undergrad. Student
Institute: University of Toronto
Project: The fast-in-time dynamics of the small-scale dynamo

- 2023 **Student:** Sam Lakerdas-Gayle (co-supervised w. Bart Ripperda), Undergrad. Student
Institute: University of Toronto
Project: The secret-life of over-dense regions in magnetised, turbulent clouds
- 2021 **Student:** [Neco Kriel](#) (co-supervised w. Christoph Federrath), Honours Student
Institute: Australian National University
Project: [Fundamental scaling relations in the turbulent dynamo.](#)
- 2021 **Student:** [Matthew Sampson](#) (co-supervised w. Mark Krumholz), Honours Student
Institute: Australian National University
Project: [Cosmic ray transport in compressible ionised MHD turbulence.](#)

Mentorships

- 2022 **Student:** Adrian Lehane
Institute: Telopea Park School / Narrabundah College (high school)
Project: Automated phase detection of Venus.

TALKS

Invited (16 total)

- APR. 2024 Invited to CITA Blackboard Theory Seminar
- APR. 2024 Invited to CITA Theory Seminar
- MAR. 2024 Invited to University Maryland Comp. Seminar and Theory
- FEB. 2024 Invited to KITP Discussion Talk.
- FEB. 2024 Invited to KITP Conference Talk.
- NOV. 2023 The most fascinating part of interstellar turbulence: the energy cascade
Presented at: TASTY Seminar Series, University of Toronto.
- MAY 2023 The World's Largest Compressible MHD Turbulence Simulation on SuperMUC-NG
Presented at: SuperMUC-NG Status and Results Workshop.
- SEP. 2022 KIPAC Tea talk: Peta-scale magnetised interstellar medium turbulence simulations.
Presented at: SLAC / Stanford University.
- SEP. 2022 Magnetised interstellar medium turbulence: dynamics & energetics.
Presented at: Susan Clark's research group, Stanford.
- SEP. 2022 Astro-coffee: Streaming cosmic rays ion Alfvén velocity statistics.
Presented at: Institute for Advanced Study.
- SEP. 2022 Bachall lunch discussion: peta-scale simulations & turbulent dynamics.
Presented at: Institute for Advanced Study.
- APR. 2022 Streaming cosmic rays ion Alfvén velocity statistics.
Presented at: Siang Peng Oh's research group, UC Santa Barbara.
- NOV. 2021 Ubiquitous magnetic field fluctuations driven by large-scale supersonic turbulence.
Presented at: Star formation and ISM Physics Seminar, Princeton.
- JAN. 2021 Ubiquitous magnetic field fluctuations driven by large-scale supersonic turbulence.
Presented at: Research School of Astronomy and Astrophysics seminar, [ANU](#).
- JUL. 2020 The Anisotropic Density Variance for Highly-Magnetised Molecular Clouds.
Presented at: Astronomical Society of Australia Bok Prize talk.
- JUN. 2020 Turbulence at the parsec scale of the Universe.
Presented at: Research highlight talk at [RSAA](#) full school meeting.
- AUG. 2018 The Fractal Geometry of the Supersonic Turbulence in the Interstellar Medium.
Presented at: [QUT](#) research highlights.
- MAY 2018 The Fractal Geometry of Turbulence.
Presented at: [QUT](#) Physics Society Meeting.

Colloquium (3 total)

- AUG. 2020 The Anisotropic Density Variance for Highly-Magnetised Molecular Clouds.
Presented at: University of Macquarie Colloquium.
- NOV. 2017 The University of Cambridge and Quantum Mechanics.
Presented at: School of Chemistry, Physics and Engineering Colloquium, [QUT](#).
- NOV. 2017 Mathematical Aspects of Mechanics.
Presented at: School of Mathematical Sciences Colloquium, [QUT](#).

Contributed (16 total)

- MAY. 2024 Interstellar medium turbulence and turbulence-regulated star formation theory
Presented at: [Globular Clusters and Their Tidal Tails: From the Milky Way to the Local Group](#), Toronto, Canada

- MAY. 2024 The Supersonic Turbulent Dynamo
Presented at: [HEDLA 2024 Workshop](#), Tallahassee, Florida
- FEB. 2022 Petascale magnetised interstellar medium turbulence simulations
Presented at: [ANITA 2022 Workshop](#).
- DEC. 2021 Understanding the nature of magnetic field fluctuations driven by large-scale supersonic turbulence.
Presented at: [Australian Institute of Physics Congress](#), [QUT](#).
- OCT. 2021 Understanding the nature of magnetic field fluctuations driven by large-scale supersonic turbulence.
Presented at: Royal Astronomical Society: Galactic magnetic fields meeting.
- FEB. 2021 Steps towards anisotropic star formation theory: A multi-shock model for the density variance of anisotropic MHD turbulence.
Presented at: [ANITA 2021 Workshop](#).
- DEC. 2020 Multi-shock model for the density variance of anisotropic, highly-magnetised ISM turbulence.
Presented at: The Magnetic Field Awakens: A new era of star formation.
- NOV. 2020 Recent progress on anisotropic, magnetised, supersonic turbulence.
Presented at: Mount Stromlo Student Seminars, 2020.
- SEP. 2020 Is the Starry Night Turbulent?
Presented at: [RSAA Feast of Facts](#).
- FEB. 2020 Density, velocity and magnetic structures and correlations in sub-Alfvénic, supersonic turbulence.
Accepted* for contributed talk: Magnetic Fields in the Universe 7, Vietnam.
- FEB. 2020 Anisotropy in the column density of highly-magnetised supersonic turbulence.
Presented at: [ANITA 2020 Workshop](#), [UNSW](#), Canberra.
- DEC. 2019 Anisotropic structures in highly-magnetised, observed turbulent clouds.
Presented at: Universality: Turbulence across vast scales, Flatiron Inst., New York
- NOV. 2019 Reconstructing the 3D Density PDF from the 2D Column Density.
Presented at: Cosmic turbulence and magnetic fields : physics of baryonic matter across time and scales in Cargèse, France, 2019.
- DEC. 2018 Mach number - fractal dimension relation for turbulent, molecular clouds.
Poster presented at: [AIP Congress 2018](#), Perth, Australia.
- JAN. 2018 The Fractal Geometry of the World's Largest Turbulence Simulation.
Presented at: Research School of Astronomy and Astrophysics, [ANU](#).
- JAN. 2017 The Analysis of Novel Magnetic Field Configurations in the H-1 NF Stellarator.
Presented at: Research School of Physics and Engineering, [ANU](#).

* did not attend due to COVID19

Public Outreach Talks (10 total)

- AUG. 2021 Building the Universe, Brick-by-brick. Presented at: Young Stars, [ANU](#), Canberra.
- MAY. 2021 Understanding The Big Bang. Presented at: Young Stars, [ANU](#), Canberra.
- MAR. 2021 The Secret Life of Cells. Presented at: Young Stars, [ANU](#), Canberra.
- JAN. 2021 Mission to Mars. Presented at: Young Stars, [ANU](#), Canberra.
- JAN. 2021 The Jiggling Universe. Presented at: SciScouts Space Squad, Canberra.
- NOV. 2020 The Jiggling Universe. Presented at: Campbell Primary School STEM day, Canberra.
- OCT. 2020 Thinking Like An Atom. Presented at: Young Stars, Canberra.
- SEP. 2020 Simulating the Universe. Presented at: SciScouts Space Squad, Canberra.
- MAR. 2020 Modelling Pandemics. Presented at: Young Stars, Canberra.
- FEB. 2020 How do scientists test their ideas? Presented at: Young Stars, Canberra.

TEACHING (23 TOTAL CONTRIBUTIONS)

Guest Lectures

- OCT. 2022 ASTR8002 ([ANU](#)): Guest lecture on MHD turbulence theory for a graduate level gas dynamics class.
- OCT. 2020 ASTR8002 ([ANU](#)): [Guest lecture on linear MHD waves](#) for a graduate level gas dynamics class.

TA experience (Click on the “Semester” to see teacher evaluation reports)

2021	Australian National University , Canberra, Australia ASTR2013: Foundations of Astrophysics	Semester Two
2018	Queensland University of Technology , Brisbane, Australia PVB101: Physics of the Large MXB105: Calculus of One and Two Variables (wrote all assessment) MXB161: Computational Explorations SEB113: Quantitative Methods in Science SEB104: Grand Challenges in Science SEB115: Experimental Science	Semester Two Semester Two Semester One Semester One & Two Semester One Semester One
2017	Queensland University of Technology , Brisbane, Australia MXB105: Calculus of One and Two Variables PVB101: Physics of the Large (Lab Demonstrator) BVB204: Ecology SEB113: Quantitative Methods in Science SEB104: Grand Challenges in Science SEB115: Experimental Science (Lab Demonstrator) MXB161: Computational Explorations	Semester Two Semester Two Semester Two Semester One & Two Semester One Semester One Semester One
2016	Queensland University of Technology , Brisbane, Australia PVB101: Physics of the Large (Lab Demonstrator) BVB202: Plant Biology (Lab Demonstrator) BVB224: Plant Diversity (Lab Demonstrator) SEB113: Quantitative Methods in Science SEB104: Grand Challenges in Science SEB115: Experimental Science (Lab Demonstrator)	Semester Two Semester Two Semester Two Semester One & Two Semester One Semester One
2015	Queensland University of Technology , Brisbane, Australia SEB113: Quantitative Methods in Science	Semester One

PUBLICATIONS

- **First author:** 13 publications (10 refereed) · **Total:** 25 publications
- **Citations:** 545 (7-July-2024) · **h index:** 14 (7-July-2024)

First Author (and joint first) Refereed (10 total)

- Beattie, J. R., & Federrath, C.** (2020). Filaments and striations: anisotropies in observed, supersonic, highly magnetized turbulent clouds. *MNRAS*, 492(1), 668–685. <https://doi.org/10.1093/mnras/stz3377>
- Beattie, J. R., Federrath, C., & Klessen, R. S.** (2019). The relation between the true and observed fractal dimensions of turbulent clouds. *MNRAS*, 487(2), 2070–2081. <https://doi.org/10.1093/mnras/stz1416>
- Beattie, J. R., Federrath, C., Klessen, R. S., & Schneider, N.** (2019). The relation between the turbulent Mach number and observed fractal dimensions of turbulent clouds. *MNRAS*, 488(2), 2493–2502. <https://doi.org/10.1093/mnras/stz1853>
- Beattie, J. R., Federrath, C., Kriel, N., Mocz, P., & Seta, A.** (2023). Growth or decay – I: universality of the turbulent dynamo saturation. *arXiv e-prints*, arXiv:2209.10749.
- Beattie, J. R., Federrath, C., & Seta, A.** (2020). Magnetic field fluctuations in anisotropic, supersonic turbulence. *MNRAS*, 498(2), 1593–1608. <https://doi.org/10.1093/mnras/staa2257>
- Beattie, J. R., Krumholz, M. R., Federrath, C., Sampson, M. L., & Crocker, R. M.** (2022). Ion alfvén velocity fluctuations and implications for the diffusion of streaming cosmic rays. *Frontiers in Astronomy and Space Sciences*, 9. <https://doi.org/10.3389/fspas.2022.900900>
- Beattie, J. R., Krumholz, M. R., Sklidis, R., Federrath, C., Seta, A., Crocker, R. M., Mocz, P., & Kriel, N.** (2022). Energy balance and Alfvén Mach numbers in compressible magnetohydrodynamic turbulence with a large-scale magnetic field. *MNRAS*. <https://doi.org/10.1093/mnras/stac2099>
- Beattie, J. R., Mocz, P., Federrath, C., & Klessen, R. S.** (2021). A multishock model for the density variance of anisotropic, highly magnetized, supersonic turbulence. *MNRAS*, 504(3), 4354–4368. <https://doi.org/10.1093/mnras/stab1037>
- Beattie, J. R., Mocz, P., Federrath, C., & Klessen, R. S.** (2022). The density distribution and physical origins of intermittency in supersonic, highly magnetised turbulence with diverse modes of driving. *MNRAS*. <https://doi.org/10.1093/mnras/stac3005>
- Birch, M., **Beattie, J. R.**, Bennet, F., Rattenbury, N., Copeland, M., Travouillon, T., Ferguson, K., Cater, J., & Sayat, M. (2023). Availability, outage, and capacity of spatially correlated, australasian free-space optical networks. *J. Opt. Commun. Netw.*, 15(7), 415–430. <https://doi.org/10.1364/JOCN.480805>

Second Author or Major Contributions Refereed (8 total)

Federrath, C., Klessen, R. S., Iapichino, L., & **Beattie, J. R.** (2021). The sonic scale of interstellar turbulence. *Nature Astronomy*, 5, 365–371. <https://doi.org/10.1038/s41550-020-01282-z>.

Measured the sonic scale position from the second order structure functions and contributed to writing the manuscript.

Kriel, N., **Beattie, J. R.**, Seta, A., & Federrath, C. (2022). Fundamental scales in the kinematic phase of the turbulent dynamo. *MNRAS*. <https://doi.org/10.1093/mnras/stac969>.

Developed the spectral fitting methodology, spectral models, taught Kriel how to use the FLASH code throughout the project and contributed to writing the manuscript.

McCool, C., **Beattie, J. R.**, Firn, J., Lehnert, C., Kulk, J., Bawden, O., Russell, R., & Perez, T. (2018). Efficacy of mechanical weeding tools: A study into alternative weed management strategies enabled by robotics. *IEEE Robotics and Automation Letters*, 3(2), 1184–1190. <https://doi.org/10.1109/LRA.2018.2794619>.

Developed and applied the survival analysis models used to compare between the different automated weeding strategies and contributed to writing the manuscript.

McCool, C., **Beattie, J. R.**, Milford, M., Bakker J. D., J. L., Moore, & Firn, J. (2018). Automating analysis of vegetation with computer vision: Cover estimates and classification. *Ecology and Evolution*, 8(12), 6005–6015. <https://doi.org/10.1002/ece3.4135>.

Developed and applied the statistical model for comparing between the different computer vision techniques and contributed to writing the manuscript.

Risch, A. C., Page-Dumroese, D. S., Schweiger, A. K., **Beattie, J. R.**, Curran, M. P., Finér, L., Liu, Y., Schütz, M., Terry, T. A., Wang, W., & Jurgensen, M. F. (2022). Controls of initial wood decomposition on and in forest soils using standard material. *Frontiers in Forests and Global Change*, 5, 829810. <https://doi.org/10.3389/ffgc.2022.829810>.

Constructed the principle data set, developed and ran parallelised hierarchical Bayesian mixed effects models and model selection methods.

Sampson, M. L., **Beattie, J. R.**, Krumholz, M. R., Crocker, R. M., Federrath, C., & Seta, A. (2023). Turbulent diffusion of streaming cosmic rays in compressible, partially ionized plasma. *MNRAS*, 519(1), 1503–1525. <https://doi.org/10.1093/mnras/stac3207>.

Ran all MHD turbulence models, provided analytical Green's function solutions to the diffusion problems, helped develop the theory and fitting for fractional diffusion transport and contributed to writing the manuscript.

Skalidis, R., Sternberg, J., **Beattie, J. R.**, Pavlidou, V., & Tassis, K. (2021). Why take the square root? An assessment of interstellar magnetic field strength estimation methods. *A&A*, 656, Article A118, A118. <https://doi.org/10.1051/0004-6361/202142045>.

Ran all MHD turbulence simulations and contributed to the theoretical development of the coupling term energy model and drafting the manuscript.

Thomas, M. L., Baker, L., **Beattie, J. R.**, & Baker, A. M. (2020). Determining the efficacy of camera traps, live capture traps, and detection dogs for locating cryptic small mammal species. *Ecology and Evolution*, 10(2), 1054–1068. <https://doi.org/10.1002/ece3.5972>.

Developed and applied the occupancy analysis models used to compare between the different detection methods and contributed to writing the manuscript.

Multi-author Refereed (4 total)

Milford, M., Firn, J., **Beattie, J.**, Jacobson, A., Pepperell, E., Mason, E., Kimlin, M., & Dunbabin, M. (2014). Automated sensory data alignment for environmental and epidermal change monitoring. *Australasian Conference on Robotics and Automation 2014*, 1–10. <https://eprints.qut.edu.au/81684/>

Schneider, N., Ossenkopf-Okada, V., Clarke, S., Klessen, R. S., Kabanovic, S., Veltchev, T., Bontemps, S., Dib, S., Csengeri, T., Federrath, C., Di Francesco, J., Motte, F., André, Ph., Arzoumanian, D., **Beattie, J. R.**, Bonne, L., Didelon, P., Elia, D., Könyves, V., ... Ward-Thompson, D. (2022). Understanding star formation in molecular clouds - iv. column density pdfs from quiescent to massive molecular clouds. *A&A*, 666, A165. <https://doi.org/10.1051/0004-6361/202039610>

Seligman, D. Z., Rogers, L. A., Feinstein, A. D., Krumholz, M. R., **Beattie, J. R.**, Federrath, C., Adams, F. C., Fatuzzo, M., & Günther, M. N. (2022). Theoretical and Observational Evidence for Coriolis Effects

in Coronal Magnetic Fields via Direct Current Driven Flaring Events. *ApJ*, 929(1), Article 54, 54. <https://doi.org/10.3847/1538-4357/ac5b69>

Sharda, P., Menon, S. H., Federrath, C., Krumholz, M. R., **Beattie, J. R.**, Jameson, K. E., Tokuda, K., Burkhart, B., Crocker, R. M., Law, C. J., Seta, A., Gaetz, T. J., Pingel, N. M., Seitenzahl, I. R., Sano, H., & Fukui, Y. (2022). First extragalactic measurement of the turbulence driving parameter: ALMA observations of the star-forming region N159E in the Large Magellanic Cloud. *MNRAS*, 509(2), 2180–2193. <https://doi.org/10.1093/mnras/stab3048>

Preprints Undergoing Review or Other (4 total)

Beattie, J. R., Federrath, C., Klessen, R. S., Cielo, S., & Bhattacharjee, A. (2024). Magnetized compressible turbulence with a fluctuation dynamo and Reynolds numbers over a million. *arXiv e-prints*, Article arXiv:2405.16626, arXiv:2405.16626. <https://doi.org/10.48550/arXiv.2405.16626>

Beattie, J. R., Federrath, C., Kriel, N., Hew, J. K. J., & Bhattacharjee, A. (2023). Taking control of compressible modes: bulk viscosity and the turbulent dynamo. *arXiv e-prints*, Article arXiv:2312.03984, arXiv:2312.03984. <https://doi.org/10.48550/arXiv.2312.03984>

Beattie, J. R., & Kriel, N. (2019). Is The Starry Night Turbulent? *arXiv e-prints*, arXiv:1902.03381.

Kriel, N., **Beattie, J. R.**, Federrath, C., Krumholz, M. R., & Hew, J. K. J. (2023). Fundamental MHD scales – II: the kinematic phase of the supersonic small-scale dynamo. *arXiv e-prints*, Article arXiv:2310.17036, arXiv:2310.17036. <https://doi.org/10.48550/arXiv.2310.17036>

MEDIA (19 TOTAL)

- 2024 [The Beauty of Chaos, New Scientist Magazine \(in print and online\)](#)
- 2024 [The world's largest magnetohydrodynamic turbulence simulation, Forschung Magazine](#)
- 2024 [German Research Foundation \(DFG\) 2024 Calendar \(March visualisation\)](#)
- 2022 [Unravelling magnetised turbulence in galaxies, Lunations, Research Bytes](#)
- 2022 [The Magic And Mystery Of Turbulence, IFL Science](#)
- 2021 [Extreme efficiency astrophysical turbulence simulations, National Computing Infrastructure, Australia](#)
- 2021 [Coffee, planes and magnetism. Space Australia, TikTok](#)
- 2021 [Unravelling the turbulent, magnetised dynamics of the interstellar medium. Space Australia](#)
- 2021 [Turbulence in the heavens, Nature Astronomy, News & Views.](#)
- 2021 [Researchers Use LRZ HPC Resources to Perform Largest-Ever Supersonic Turbulence Simulation, Gauss Centre for Supercomputing](#)
- 2021 [The Role of Turbulence in the Birth of Stars, University Heidelberg.](#)
- 2021 [Star-making motion, COSMOS magazine](#)
- 2021 [Study helps unlocks secrets of star formation, ANU Media](#)
- 2021 [Stellar Simulation Reveals The Turbulent Nature of Star Birth, Space Australia.](#)
- 2021 [The Need for \(Sound\) Speed, Astrobite research highlight](#)
- 2019 [Modelling Star Formation with a Supercomputer: Computational Astrophysics Research, National Computing Infrastructure Australia](#)
- 2019 [Feature article on turbulence depicted in Van Gogh's Starry Night in the Art's and Culture section of the American Physical Societies Magazine.](#)
- 2018 [QUT advertising photoshoot for the BSc and BMath degree on QUT's blackboard website.](#)
- 2018 [QUT media exposure, and photoshoot for our publication, Automating Analysis of Vegetation with Computer Vision: cover estimates.](#)