Drummond B. Fielding

Curriculum Vitae

Assistant Professor

Department of Astronomy, Cornell University, 122 Sciences Dr, Ithaca, NY 14850

☑ drummondfielding@gmail.com ☑ dfielding14.github.io ⑪ arXiv ⑩ ORCiD

Publications — ADS search — ORCID

total: 64 - citations: 2752 - h-index: $27 (30 \text{ Nov } 2024) - * \text{indicates} \ge 100 \text{ citations}$

First Author

- 8 Fielding, D.B.; Ripperda, B.; Philippov, A.A., *Plasmoid Instability in the Multiphase Interstellar Medium*, ApJ, 949, 2023 (arXiv:2211.06434) [21 citations]
- *7 **Fielding, D. B.**; Bryan, G. L., *The Structure of Multiphase Galactic Winds*, ApJ, 924, 82, 2022 (arXiv:2108.05355) [108 citations]
- ⁶ Fielding, D. B.; Tonnesen, S.; DeFelippis, D.; Li, M. et al., First Results from SMAUG: Uncovering the Origin of the Multiphase Circumgalactic Medium with a Comparative Analysis of Idealized and Cosmological Simulations, ApJ, 903, 32, 2020 (arXiv:2006.16316) [75 citations]
- *5 **Fielding, D. B.**; Ostriker, E. C.; Bryan, G. L.; Jermyn, A. S., Multiphase Gas and the Fractal Nature of Radiative Turbulent Mixing Layers, ApJ, 894, 2020 (arXiv:2003.08390) [155 citations]
- *4 **Fielding, D. B.**; Quataert, E.; Martizzi, D., Clustered supernovae drive powerful galactic winds after superbubble breakout, MNRAS, 481, 3325, 2018 (arXiv:1807.08758) [183 citations]
- *3 **Fielding, D. B.**; Quataert, E.; Martizzi, D.; Faucher-Giguère, C., *How supernovae launch galactic winds*, MNRAS, 470, 2017 (arXiv:1704.01579) [106 citations]
- *2 Fielding, D. B.; Quataert, E.; McCourt, M.; Thompson, T. A., The impact of star formation feedback on the circumgalactic medium, MNRAS, 466, 3810, 2017 (arXiv:1606.06734) [191 citations]
- *1 Fielding, D. B.; McKee, C. F.; Socrates, A.; Cunningham, A. J. et al., The turbulent origin of spin-orbit misalignment in planetary systems, MNRAS, 450, 3306, 2015 (arXiv:1409.5148) [100 citations]

Second Author (‡=mentor for student led project)

- 17 Smith, M. C.; Fielding, D. B.; Bryan, G. L.; Bennett, J. S. et al., Arkenstone II. A model for unresolved cool clouds entrained in galactic winds in cosmological simulations, MNRAS(arXiv:2408.15321) [3 citations]
- ^{‡16} Abruzzo, M. W.; **Fielding, D. B.**; Bryan, G. L., *Taming the TuRMoiL: The Temperature Dependence of Turbulence in Cloud–Wind Interactions*, ApJ, 966, 181 (arXiv:2210.15679) [19 citations]
- 15 Stern, J.; Fielding, D. B.; Hafen, Z.; Su, K. et al., Accretion onto disc galaxies via hot and rotating CGM inflows, MNRAS, 530, 1711 (arXiv:2306.00092) [27 citations]
- ^{‡14} Tan, B.; **Fielding, D. B.**, Cloud atlas: navigating the multiphase landscape of tempestuous galactic winds, MNRAS, 527, 9683 (arXiv:2305.14424) [26 citations]
- 13 Smith, M. C.; Fielding, D. B.; Bryan, G. L.; Kim, C. et al., ARKENSTONE I. A novel method for robustly capturing high specific energy outflows in cosmological simulations, MNRAS, 527, 1216 (arXiv:2301.07116) [21 citations]
- Kempski, P.; Fielding, D. B.; Quataert, E.; Galishnikova, A. K. et al., Cosmic ray transport in large-amplitude turbulence with small-scale field reversals, MNRAS, 525, 4985 (arXiv:2304.12335) [25 citations]
- ‡11 Pandya, V.; Fielding, D. B.; Bryan, G. L.; Carr, C. et al., A Unified Model for the Coevolution of Galaxies and Their Circumgalactic Medium: The Relative Roles of Turbulence and Atomic Cooling Physics, ApJ, 956, 118 (arXiv:2211.09755) [23 citations]
- ‡10 Abruzzo, M. W.; Fielding, D. B.; Bryan, G. L., TuRMoiL of Survival: A Unified Survival Criterion for Cloud-Wind Interactions (arXiv:2307.03228) [11 citations]
- ^{‡9} Chen, Z.; **Fielding, D. B.**; Bryan, G. L., The Anatomy of a Turbulent Radiative Mixing Layer: Insights from an Analytic Model with Turbulent Conduction and Viscosity, ApJ, 950, 91 (arXiv:2211.01395) [9 citations]

- ^{‡8} Orr, M. E.; **Fielding, D. B.**; Hayward, C. C.; Burkhart, B., Bursting Bubbles: Feedback from Clustered Supernovae and the Trade-off Between Turbulence and Outflows, ApJ, 932, 88 (arXiv:2109.14656) [39 citations]
- ^{‡7} Orr, M. E.; **Fielding, D. B.**; Hayward, C. C.; Burkhart, B., Bursting Bubbles: Clustered Supernova Feedback in Local and High-redshift Galaxies, ApJ, 924 (arXiv:2109.14626) [16 citations]
- ⁶ Stachenfeld, K.; **Fielding, D. B.**; Kochkov, D.; Cranmer, M. et al., Learned Coarse Models for Efficient Turbulence Simulation (arXiv:2112.15275) [75 citations]
- *±5 Pandya, V.; **Fielding, D. B.**; Anglés-Alcázar, D.; Somerville, R. S. et al., Characterizing mass, momentum, energy, and metal outflow rates of multiphase galactic winds in the FIRE-2 cosmological simulations, MNRAS, 508, 2979 (arXiv:2103.06891) [117 citations]
- ^{‡4} Butsky, I. S.; **Fielding, D. B.**; Hayward, C. C.; Hummels, C. B. et al., The Impact of Cosmic Rays on Thermal Instability in the Circumgalactic Medium, ApJ, 903, 77 (arXiv:2008.04915) [93 citations]
- 3 Stern, J.; **Fielding, D. B.**; Faucher-Giguère, C.; Quataert, E., *The maximum accretion rate of hot gas in dark matter haloes*, MNRAS, 492, 6042 (arXiv:1909.07402) [76 citations]
- *2 Stern, J.; Fielding, D. B.; Faucher-Giguère, C.; Quataert, E., Cooling flow solutions for the circumgalactic medium, MNRAS, 488, 2549 (arXiv:1906.07737) [104 citations]
- *1 Martizzi, D.; **Fielding, D. B.**; Faucher-Giguère, C.; Quataert, E., Supernova feedback in a local vertically stratified medium: interstellar turbulence and galactic winds, MNRAS, 459, 2311 (arXiv:1601.03399) [131 citations]

Co-author

- 39 Voit, G. M.; Carr, C.; **Fielding, D. B.** et al., Equilibrium States of Galactic Atmospheres. II. Interpretation and Implications, ApJ, 976, 151 (arXiv:2406.07632) [3 citations]
- ³⁸ Voit, G. M.; Pandya, V.; **Fielding, D. B.** et al., Equilibrium States of Galactic Atmospheres. I. The Flip Side of Mass Loading, ApJ, 976, 150 (arXiv:2406.07631) [3 citations]
- Perrotta, S. et al. (incl. **DBF**), The Outflowing [O II] Nebulae of Compact Starburst Galaxies at $z \sim 0.5$, ApJ, 975, 263 (arXiv:2409.10013)
- Hassan, S. et al. (incl. **DBF**), Toward Implementation of the Pressure-regulated, Feedback-modulated Model of Star Formation in Cosmological Simulations: Methods and Application to TNG, ApJ, 975, 151 (arXiv:2409.09121)
- Bennett, J. S.; Smith, M. C.; **Fielding, D. B.** et al., Prevention is better than cure? Feedback from high specific energy winds in cosmological simulations with Arkenstone (arXiv:2410.12909)
- 34 Choi, B. et al. (incl. **DBF**), The Metallicity Mapping of the Ionized Diffuse Gas at the Milky Way Disk-halo Interface (arXiv:2410.06286)
- 33 Stone, J. M.; Mullen, P. D.; **Fielding, D. B.** et al., AthenaK: A Performance-Portable Version of the Athena++ AMR Framework (arXiv:2409.16053) [7 citations]
- Hummels, C. B.; Rubin, K. H. R.; Schneider, E. E.; **Fielding, D. B.**, CLOUDFLEX: A Flexible Parametric Model for the Small-scale Structure of the Circumgalactic Medium, ApJ, 972, 148 (arXiv:2311.05691) [6 citations]
- Kim, C. et al. (incl. **DBF**), Metallicity Dependence of Pressure-regulated Feedback-modulated Star Formation in the TIGRESS-NCR Simulation Suite, ApJ, 972, 67 (arXiv:2405.19227) [7 citations]
- 30 Su, K. et al. (incl. **DBF**), Unravelling jet quenching criteria across L* galaxies and massive cluster ellipticals, MNRAS, 532, 2724 (arXiv:2310.17692) [9 citations]
- 29 Steinwandel, U. P.; Rennehan, D.; Orr, M. E.; **Fielding, D. B.** et al., Pumping Iron: How turbulent metal diffusion impacts multiphase galactic outflows (arXiv:2407.14599) [5 citations]
- Ramesh, R.; Nelson, D.; **Fielding, D. B.** et al., Zooming in on the Circumgalactic Medium with GIBLE: Tracing the Origin and Evolution of Cold Clouds (arXiv:2407.00172) [4 citations]
- 27 Hamel-Bravo, M. J. et al. (incl. **DBF**), DUVET: Resolved direct metallicity measurements in the outflow of starburst galaxy NGC 1569, MNRAS, 530, 3855 (arXiv:2404.04600)
- ²⁶ Fisher, D. B.; Bolatto, A. D.; Chisholm, J.; **Fielding, D.** *et al.*, *JWST Observations of Starbursts: Cold Clouds and Plumes Launching in the M82 Outflow* (arXiv:2405.03686) [2 citations]
- Ramesh, R.; Nelson, D.; **Fielding, D. B.** et al., Zooming in on the circumgalactic medium with GIBLE. The topology and draping of magnetic fields around cold clouds, A&A, 684 (arXiv:2404.01370) [3 citations]

- 24 Reichardt Chu, B. et al. (incl. **DBF**), DUVET: sub-kiloparsec resolved star formation driven outflows in a sample of local starbursting disk galaxies (arXiv:2402.17830) [5 citations]
- 23 Coil, A. L. et al. (incl. **DBF**), lonized gas extends over 40 kpc in an odd radio circle host galaxy, Nature, 625, 459 (arXiv:2310.15162) [9 citations]
- Steinwandel, U. P. et al. (incl. **DBF**), The Structure and Composition of Multiphase Galactic Winds in a Large Magellanic Cloud Mass Simulated Galaxy, ApJ, 960, 100 (arXiv:2212.03898) [30 citations]
- Roy, M.; Su, K.; Tonnesen, S.; **Fielding, D. B.** et al., Seeding the CGM: how satellites populate the cold phase of milky way haloes, MNRAS, 527, 265 (arXiv:2310.04404) [8 citations]
- 20 Qutob, N. et al. (incl. DBF), Observational Signatures of AGN Feedback in the Morphology and the Ionization States of Milky Way-like Galaxies (arXiv:2312.14809) [2 citations]
- 19 McPherson, D. K. et al. (incl. **DBF**), DUVET survey: mapping outflows in the metal-poor starburst Mrk 1486, MNRAS, 525, 6170 (arXiv:2308.06918) [9 citations]
- tale Carr, C.; Bryan, G. L.; **Fielding, D. B.** et al., Regulation of Star Formation by a Hot Circumgalactic Medium, ApJ, 949, 21 (arXiv:2211.05115) [19 citations]
- Reichardt Chu, B. et al. (incl. **DBF**), DUVET: Spatially Resolved Observations of Star Formation Regulation via Galactic Outflows in a Starbursting Disk Galaxy, ApJ, 941, 163 (arXiv:2211.02063) [12 citations]
- Butsky, I. S.; Werk, J. K.; Tchernyshyov, K.; **Fielding, D. B.** et al., The Impact of Cosmic Rays on the Kinematics of the Circumgalactic Medium, ApJ, 935, 69 (arXiv:2106.14889) [20 citations]
- Hafen, Z. et al. (incl. **DBF**), Hot-mode accretion and the physics of thin-disc galaxy formation, MNRAS, 514, 5056 (arXiv:2201.07235) [73 citations]
- ^{‡14} Abruzzo, M. W.; Bryan, G. L.; **Fielding, D. B.**, A Simple Model for Mixing and Cooling in Cloud-Wind Interactions, ApJ, 925, 199 (arXiv:2101.10344) [42 citations]
- 13 Stern, J. et al. (incl. **DBF**), Neutral CGM as damped Ly α absorbers at high redshift, MNRAS, 507, 2869 (arXiv:2105.06489) [28 citations]
- *12 Stern, J.; Faucher-Giguère, C.; **Fielding, D. B.** et al., Virialization of the Inner CGM in the FIRE Simulations and Implications for Galaxy Disks, Star Formation, and Feedback, ApJ, 911, 88 (arXiv:2006.13976) [109 citations]
- 11 Cranmer, M.; Cui, C.; **Fielding, D. B.**; Sanchez-Gonzalez, A. et al., Interpretable Deep Learning for Computational Fluid Dynamics, APS Division of Fluid Dynamics Meeting Abstracts, 2021
- Pandya, V. et al. (incl. **DBF**), First Results from SMAUG: The Need for Preventative Stellar Feedback and Improved Baryon Cycling in Semianalytic Models of Galaxy Formation, ApJ, 905, 4 (arXiv:2006.16317) [45 citations]
- 9 Burkhart, B. et al. (incl. **DBF**), The Catalogue for Astrophysical Turbulence Simulations (CATS), ApJ, 905, 14 (arXiv:2010.11227) [22 citations]
- 8 Kim, C.; Ostriker, E. C.; **Fielding, D. B.** *et al.*, A *Framework for Multiphase Galactic Wind Launching Using TIGRESS*, ApJ, 903 (arXiv:2010.09090) [49 citations]
- *7 Kim, C. et al. (incl. **DBF**), First Results from SMAUG: Characterization of Multiphase Galactic Outflows from a Suite of Local Star-forming Galactic Disk Simulations, ApJ, 900, 61 (arXiv:2006.16315) [120 citations]
- 6 Lochhaas, C. et al. (incl. **DBF**), Properties of the simulated circumgalactic medium, MNRAS, 493, 1461 (arXiv:1908.00021) [43 citations]
- 5 Voit, G. M.; Babul, A.; Babyk, I. et al., Circumgalactic Gas and the Precipitation Limit (arXiv:1903.11212)
- ⁴ Martizzi, D.; Quataert, E.; Faucher-Giguère, C.; **Fielding, D.**, *Simulations of jet heating in galaxy clusters: successes and challenges*, MNRAS, 483, 2465 (arXiv:1805.06461) [57 citations]
- 3 Stern, J. et al. (incl. **DBF**), Does Circumgalactic O VI Trace Low-pressure Gas Beyond the Accretion Shock? Clues from H I and Low-ion Absorption, Line Kinematics, and Dust Extinction, ApJ, 865, 91 (arXiv:1803.05446) [61 citations]
- offner, S. S. R. et al. (incl. **DBF**), The Turbulent Origin of Outflow and Spin Misalignment in Multiple Star Systems, ApJ, 827 (arXiv:1606.08445) [122 citations]
- 1 Schlieder, J. E. et al. (incl. **DBF**), The Na 8200 Å Doublet as an Age Indicator in Low-mass Stars, AJ, 143, 114 (arXiv:1202.4191) [65 citations]