Dr. James Wurster
List of Publications

Refereed journal publications

1. *The role of drag and gravity on dust concentration in a gravitationally unstable disc.*
   S. Rowther, R. Nealon, F. Meru, **J. Wurster**, H. Aly, R. Alexander, K. Rice, & R. A. Booth.
   MNRAS, 528, 2490-2500. Feb. 2024. https://doi.org/10.1093/mnras/stae167.

2. *Star-forming environments in smoothed particle magnetohydrodynamics simulations II: Re-simulating isolated clumps to determine equivalence of extracted clumps and parent simulations.*
   J. Wurster & C. Rowan.
   MNRAS, 528, 2257-2273. Feb. 2024. https://doi.org/10.1093/mnras/stae090.

3. *Star-forming environments in smoothed particle magnetohydrodynamics simulations I: Clump extraction and properties.*
   J. Wurster & C. Rowan.
   MNRAS, 523, 3025-3042. Aug. 2023. https://doi.org/10.1093/mnras/stad1605.

4. *Gas and star kinematics in cloud-cloud collisions.*
   J. Wurster & I. A. Bonnell.
   MNRAS 522, 891-911, June 2023. doi:10.1093/mnras/stad1022.

5. *Rogue planets and brown dwarfs: Predicting the populations of free-floating planetary mass objects observable with JWST.*
   A. Scholz, K. Muzic, R. Jayawardhana, L. Quinlan & **J. Wurster**.
   PASP, 134:104401, Oct 2022. doi:10.1088/1538-3873/ac9431.

6. *The initial magnetic criticality of prestellar cores.*
   F. Priestley, C. Yin & **J. Wurster**.
   MNRAS, 515, 5689-5697, Oct 2022. doi:10.1093/mnras/stac2107.

7. *On the origin of magnetic fields in stars II: The effect of numerical resolution.*
   J. Wurster, M. R. Bate, D. J. Price & I. A. Bonnell.
   MNRAS, 511, 746-764, March 2022. doi:10.1093/mnras/stac123.

8. *The formation and early evolution of embedded star clusters in spiral galaxies.*
   S. Rieder, C. Dobbs, T. Bending, K. Y. Liow & **J. Wurster**.
   MNRAS, 509, 6155-6168, Feb 2022. doi:10.1093/mnras/stab3425.

9. *The impact of non-ideal magnetohydrodynamic processes on discs, outflows, counter-rotation and magnetic walls during the early stages of star formation.*
   J. Wurster, M. R. Bate & I. A. Bonnell.
   MNRAS, 507, 2354-2372, Oct 2021. doi:10.1093/mnras/stab2296.

10. *Investigating the role of magnetic fields in star formation using molecular line profiles.*
    C. Yin, F. D. Priestley & **J. Wurster**.
    MNRAS, 504, 2381-2389, June 2021. doi:10.1093/mnras/stab1039.

11. *The properties of clusters, and the orientation of magnetic fields relative to filaments, in magnetohydrodynamic simulations of colliding clouds.*
    C. Dobbs & **J. Wurster**.
    MNRAS, 502, 2285-2295, April 2021. doi:10.1093/mnras/stab150.

12. *Do we need non-ideal magnetohydrodynamics to model protostellar discs?*
    J. Wurster.
    MNRAS, 501, 5873-5891, March 2021. doi:10.1093/mnras/staa3943.

13. *Non-ideal magnetohydrodynamics vs turbulence II:*
Which is the dominant process in stellar core formation?
J. Wurster & B. T. Lewis.
MNRAS, 495, 3807-3818, July 2020. doi:10.1093/mnras/staa1340.

14. *Non-ideal magnetohydrodynamics vs turbulence I:*
Which is the dominant process in protostellar disc formation?
J. Wurster & B. T. Lewis.
MNRAS, 495, 3795-3806, July 2020. doi:10.1093/mnras/staa1339.

15. *There is no magnetic braking catastrophe:*
Low-mass star cluster and protostellar disc formation with non-ideal magnetohydrodynamics.
J. Wurster, M. R. Bate & D. J. Price.
MNRAS, 489, 1719-1741, Oct 2019. doi:10.1093/mnras/stz2215.

16. *Ambipolar diffusion and the molecular abundances in pre-stellar cores.*
F. D. Priestley, **J. Wurster** & S. Viti.
MNRAS, 488, 2357-2364, Sept 2019. doi:10.1093/mnras/stz1869.
Erratum: MNRAS, 503, 2899-2901, May 2021. doi:10.1093/mnras/stab702.

17. *Disc formation and fragmentation using radiative non-ideal magnetohydrodynamics.*
J. Wurster & M. R. Bate.
MNRAS, 486, 2587-2603, June 2019. doi:10.1093/mnras/stz1023.

18. *The role of magnetic fields in the formation of protostellar discs.*
J. Wurster & Z.-Y. Li.
Frontiers in Astronomy and Space Science, 5, 39, December 2018. doi:10.3389/fspas.2018.00039.

19. *On the origin of magnetic fields in stars.*
J. Wurster, M. R. Bate & D. J. Price.
MNRAS, 481, 2450-2457, December 2018. doi:10.1093/mnras/sty2438.

20. *Hall effect-driven formation of gravitationally unstable discs in magnetized molecular cloud cores.*
J. Wurster, M. R. Bate & D. J. Price.
MNRAS, 480, 4434-4442, November 2018. doi:10.1093/mnras/sty2212.

21. *Phantom, A Smoothed Particle Hydrodynamics and Magnetohydrodynamics Code for Astrophysics.*
D. J. Price, **J. Wurster**, T. S. Tricco, C. Nixon, S. Toupin, A. Pettitt, C. Chan, D. Mentiplay, G. Laibe, S. Glover, C. Dobbs, R. Nealon, D. Liptai, H. Worpel, C. Bonnerot, G. Dipierro, G. Ballabio, E. Ragusa, C. Federrath, R. Iaconi, T. Reichardt, D. Forgan, M. Hutchison, T. Constantino, B. Ayliffe, K. Hirsh & G. Lodato.
PASA, 35, e031, September 2018. doi:10.1017/pasa.2018.25.

22. *The effect of extreme ionization rates during the initial collapse of a molecular cloud core.*
J. Wurster, M. R. Bate & D. J. Price.
MNRAS, 476, 2063-2074, May 2018. doi:10.1093/mnras/sty392.

23. *The collapse of a molecular cloud core to stellar densities using radiation non-ideal magnetohydrodynamics.*
J. Wurster, M. R. Bate & D. J. Price.
MNRAS, 475, 1859-1880, April 2018. doi:10.1093/mnras/stx3339.

24. *The impact of non-ideal magnetohydrodynamics on binary star formation.*
J. Wurster, D. J. Price & M. R. Bate.
MNRAS, 466, 1788-1804, April 2017. doi:10.1093/mnras/stw3181.

25. *Does turbulence determine the initial mass function?*
D. Liptai, D. J. Price, **J. Wurster** & M. R. Bate.
MNRAS, 465, 105-110, February 2017. doi:10.1093/mnras/stw2770.

26. *The effect of a wider initial separation on common envelope binary interaction simulations.*
R. Iaconi, T. Reichardt, J. Staff, O. De Marco, J.-C. Passy, D. Price, **J. Wurster** & F. Herwig.
MNRAS, 464, 4028-4044, February 2017. doi:10.1093/mnras/stw2377.

27. *NICIL: A Stand Alone Library to Self-Consistently Calculate Non-Ideal Magnetohydrodynamic Coefficients in Molecular Cloud Cores.*
J. Wurster.
PASA, 33, e041, September 2016. doi:10.1017/pasa.2016.34.

28. *Comparing Simulations of AGN Feedback.*
M. L. A. Richardson, E. Scannapieco, J. Devriendt, A. Slyz, R. J. Thacker, Y. Dubois, **J. Wurster** & J. Silk.
ApJ, 825, 83, July 2016. doi:10.3847/0004-637X/825/2/83.

29. *Can non-ideal magnetohydrodynamics solve the magnetic braking catastrophe?*
J. Wurster, D. J. Price & M. R. Bate.
MNRAS, 457, 1037-1061, March 2016. doi:10.1093/mnras/stw013,

30. *Ambipolar diffusion in smoothed particle magnetohydrodynamics.*
J. Wurster, D. Price & B. Ayliffe.
MNRAS, 444, 1104-1112, October 2014. doi:10.1093/mnras/stu1524.

31. *AGN feedback models:*
Correlations with star formation and observational implications of time evolution.
R. J. Thacker, C. MacMackin, **J. Wurster** & A. Hobbs.
MNRAS, 443, 1125-1141, September 2014. doi:10.1093/mnras/stu1180.

32. *Cloud angular momentum and effective viscosity in global SPH simulations with feedback.*
D. J. Williamson, R. J. Thacker, **J. Wurster** & B. K. Gibson.
MNRAS, 442, 3674-3685, August 2014. doi:10.1093/mnras/stu1121.

33. *A comparative study of AGN feedback algorithms.*
J. Wurster & R. J. Thacker.
MNRAS, 431, 2513-2534, May 2013. doi:10.1093/mnras/stt346.

34. *Accretion disc particle accretion in major merger simulations.*
J. Wurster & R. J. Thacker.
MNRAS, 431, 539-553, May 2013. doi:10.1093/mnras/stt182.

35. *Magnetically-regulated fragmentation induced by nonlinear flows and ambipolar diffusion.*
S. Basu, G. E. Ciolek, W. B. Dapp & **J. Wurster**.
New A, 14, 483-495, July 2009. doi:10.1016/j.newast.2009.01.004.

36. *Nonlinear evolution of gravitational fragmentation regulated by magnetic fields and ambipolar diffusion.*
S. Basu, G. E. Ciolek & **J. Wurster**.
New A, 14, 221-237, April 2009. doi:10.1016/j.newast.2008.07.006.

Conference proceedings (not refereed)

1. *Resolving numerical star formation, A cautionary tale.*
J. Wurster & M. R. Bate.
Proceedings of the 14th international SPHERIC workshop, Exeter, United Kingdom, June 2019.

2. *Investigating prescriptions for artificial resistivity in smoothed particle magnetohydrodynamics.*
J. Wurster, M. R. Bate, D. J. Price & T. S. Tricco.
Proceedings of the 12th international SPHERIC workshop, Ourense, Spain, June 2017.