

PUBLICATION LIST

My full listing on INSPIRE-HEP is available [here](#).

White Papers that I have contributed to are listed at the [end of this document](#).

Papers lead by PhD students under my supervision are marked with a dagger (†).

Publications and pre-prints

1. † *Daily Modulation Constraints on Light Dark Matter with DAMIC-M*
K. Aggarwal et al. (DAMIC-M Collaboration, including **B. J. Kavanagh**)
Submitted to PRD, [arXiv:2511.13962](#)
2. † *A Fast Earth-scattering Formalism for Light Dark Matter with Dark Photon Mediators*
A. Lantero-Barreda, C. Centeno, **B. J. Kavanagh**, N. Castelló-Mor
Submitted to PRD, [arXiv:2511.10589](#)
3. *Hints of Dark Matter Spikes in Low-mass X-ray Binaries: a critical assessment*
F. Scarcella, **B. J. Kavanagh**
Submitted to PRD, [arXiv:2510.11635](#)
4. *First Production of Skipper-CCD Modules for the DAMIC-M Experiment*
H. Lin, M. Traina, S. Paul et al. (DAMIC-M Collaboration, including **B. J. Kavanagh**)
[arXiv:2509.06943](#)
5. † *Signatures of Fuzzy Dark Matter Inside Radial Critical Curves*
J. M. Palencia et al. (including **B. J. Kavanagh**)
Astronomy & Astrophysics 701, A24 (2025), [arXiv:2505.24373](#)
6. † *Microlensing at Cosmological Distances: Event Rate Predictions in the Warhol Arc of MACS 0416*
J. M. Palencia, J. M. Diego, L. Dai et al. (including **B. J. Kavanagh**)
Astronomy & Astrophysics 699, A295 (2025), [arXiv:2504.07039](#)
7. *Probing Benchmark Models of Hidden-Sector Dark Matter with DAMIC-M*
K. Aggarwal et al. (DAMIC-M Collaboration, including **B. J. Kavanagh**)
Phys. Rev. Lett. 135, 071002 (2025), [arXiv:2503.14617](#)
8. † *The cosmic history of Primordial Black Hole accretion and its uncertainties*
P. Jangra, D. Gaggero, **B. J. Kavanagh**, J. M. Diego
JCAP 08 (2025) 006, [arXiv:2412.11921](#)
9. *Unexplained correlation between the Cosmic Microwave Background temperature and the local matter density distribution*
M. Cruz, E. Martínez-González, C. Gimeno-Amo, **B. J. Kavanagh**, M. Tucci
JCAP 04 (2025) 079, [arXiv:2407.17599](#)
10. *Axions in Andromeda: Searching for Minicluster – Neutron Star Encounters with the Green Bank Telescope*
L. Walters, J. Shroyer, M. Edenton, P. Agrawal, B. Johnson, **B. J. Kavanagh**, D. J. E. Marsh, L. Visinelli
Phys. Rev. D 110, 123002 (2024), [arXiv:2407.13060](#)
11. *Dark Matter Mounds: towards a realistic description of dark matter overdensities around black holes*
G. Bertone, A. R. A. C. Wierda, D. Gaggero, **B. J. Kavanagh**, M. Volonteri, N. Yoshida
Phys. Rev. D 112, 043537 (2025), [arXiv:2404.08731](#)
12. *Sharpening the dark matter signature in gravitational waveforms II: Numerical simulations with the NbodyIMRI code*
B. J. Kavanagh, T. K. Karydas, G. Bertone, P. Di Cintio, M. Pasquato
Phys. Rev. D 111, 063071 (2025), [arXiv:2402.13762](#)
Code available [here](#) (archived on [Zenodo](#))

13. *Sharpening the dark matter signature in gravitational waveforms I: Accretion and eccentricity evolution*
T. K. Karydas, **B. J. Kavanagh**, G. Bertone
[Phys. Rev. D 111, 063070 \(2025\)](#), [arXiv:2402.13053](#)
14. *Phonon dynamics for light dark matter detection*
M. Raya-Moreno, **B. J. Kavanagh**, L. Fàbrega, R. Rurali
[Phys. Rev. D 110, 112007 \(2024\)](#), [arXiv:2311.11930](#)
15. *Statistics of magnification for extremely lensed high redshift stars*
J. M. Palencia, J. M. Diego, **B. J. Kavanagh**, J. Martinez
[Astronomy & Astrophysics 687, A81 \(2024\)](#), [arXiv:2307.09505](#)
16. *Search for Daily Modulation of MeV Dark Matter Signals with DAMIC-M*
I. Arnquist et al. (DAMIC-M Collaboration, including **B. J. Kavanagh**)
[Phys. Rev. Lett. 132, 101006 \(2024\)](#), [arXiv:2307.07251](#)
17. *Impact of dark matter spikes on the merger rates of Primordial Black Holes*
P. Jangra, **B. J. Kavanagh**, J. M. Diego
[JCAP 11 \(2023\) 069](#), [arXiv:2304.05892](#)
18. *Tagging and localisation of ionizing events using NbSi transition edge phonon sensors for Dark Matter searches*
EDELWEISS Collaboration and **B. J. Kavanagh**
[Phys. Rev. D 108, 022006](#), [arXiv:2303.02067](#)
19. *Disks, spikes, and clouds: distinguishing environmental effects on BBH gravitational waveforms*
P. S. Cole, G. Bertone, A. Coogan, D. Gaggero, T. Karydas, **B. J. Kavanagh**, T. F. M. Spieksma, G. M. Tomaselli
[Nature Astronomy 7, 943–950 \(2023\)](#), [arXiv:2211.01362](#)
20. *Measuring dark matter spikes around primordial black holes with Einstein Telescope and Cosmic Explorer*
P. S. Cole, A. Coogan, **B. J. Kavanagh**, G. Bertone
[Phys. Rev. D 107, 083006 \(2023\)](#), [arXiv:2207.07576](#)
Highlighted in [Nature Astronomy 7, 511 \(2023\)](#)
21. *The Canfranc Axion Detection Experiment (CADEx): Search for axions at 90 GHz with Kinetic Inductance Detectors*
B. Aja et al., including **B. J. Kavanagh** (CADEx collaboration)
[JCAP 11 \(2022\) 044](#), [arXiv:2206.02980](#)
22. *Dancing in the dark: detecting a population of distant primordial black holes*
M. Martinelli, F. Scarcella, N. B. Hogg, **B. J. Kavanagh**, D. Gaggero, P. Fleury
[JCAP 08 \(2022\) 006](#), [arXiv:2205.02639](#)
23. *Complementarity of direct detection experiments in search of light Dark Matter*
J. R. Angevaare, G. Bertone, A. P. Colijn, M. P. Decowski, **B. J. Kavanagh**
[JCAP 10 \(2022\) 004](#), [arXiv:2204.01580](#)
24. *Godzilla, a monster lurks in the Sunburst galaxy*
J. M. Diego, M. Pascale, **B. J. Kavanagh**, P. Kelly, L. Dai, B. Frye, T. Broadhurst
[Astron. & Astrophys., 665 \(2022\) A134](#), [arXiv:2203.08158](#)
Highlighted in [Nature 610, 10 \(2022\)](#)
25. *Search for sub-GeV Dark Matter via Migdal effect with an EDELWEISS germanium detector with NbSi TES sensors*
EDELWEISS Collaboration and **B. J. Kavanagh**
[Phys. Rev. D 106, 062004 \(2022\)](#), [arXiv:2203.03993](#)
26. *Cosmology and direct detection of the Dark Axion Portal*
J. Cortabitarte Gutiérrez, **B. J. Kavanagh**, N. Castelló-Mor, F. J. Casas, J. M. Diego, E. Martínez-González, R. Vilar Cortabitarte

- Submitted to PRD, [arXiv:2112.11387](#)
 Code available [here](#) (archived on [Zenodo](#))
27. *Scattering searches for dark matter in subhalos: neutron stars, cosmic rays, and old rocks*
 J. Bramante, **B. J. Kavanagh**, N. Raj
[Phys. Rev. Lett. 128, 231801 \(2022\)](#), [arXiv:2109.04582](#)
 28. *Measuring the dark matter environments of black hole binaries with gravitational waves*
 A. Coogan, G. Bertone, D. Gaggero, **B. J. Kavanagh**, D. A. Nichols
[Phys. Rev. D 105, 043009 \(2022\)](#), [arXiv:2108.04154](#)
 Code available [here](#)
 Featured on [NewScientist.nl](#)
 29. *The Effect of Mission Duration on LISA Science Objectives*
 P. Amaro-Seoane et al.
[Gen. Relativ. Gravit. 54, 3 \(2022\)](#), [arXiv:2107.09665](#)
 30. *Transient Radio Signatures from Neutron Star Encounters with QCD Axion Miniclusters*
 T. D. P. Edwards, **B. J. Kavanagh**, L. Visinelli, C. Weniger
[Phys. Rev. Lett. 127, 131103 \(2021\)](#), [arXiv:2011.05378](#)
 Code available [here](#) (archived on [Zenodo](#))
 Featured in the blog [Ça Se Passe Là-Haut](#)
 31. *Stellar Disruption of Axion Miniclusters in the Milky Way*
B. J. Kavanagh, T. D. P. Edwards, L. Visinelli, C. Weniger
[Phys. Rev. D 104, 063038 \(2021\)](#), [arXiv:2011.05377](#)
 Code available [here](#) (archived on [Zenodo](#))
 32. *Integral X-ray constraints on sub-GeV Dark Matter*
 M. Cirelli, N. Fornengo, **B. J. Kavanagh**, E. Pinetti
[Phys. Rev. D 103, 063022 \(2021\)](#), [arXiv:2007.11493](#)
 33. *Primordial Black Holes as a dark matter candidate*
 A. M. Green, **B. J. Kavanagh**
[J. Phys. G 48 \(2021\) 4, 043001](#), [arXiv:2007.10722](#)
 Code and constraints available [here](#)
 34. *Measuring the local Dark Matter density in the laboratory*
B. J. Kavanagh, T. Emken, R. Catena
[Phys. Rev. D 104, 083023 \(2021\)](#), [arXiv:2004.01621](#)
 Code available [here](#) (archived on [Zenodo](#)) and [here](#)
 35. *Detecting dark matter around black holes with gravitational waves: Effects of dark-matter dynamics on the gravitational waveform*
B. J. Kavanagh, D. A. Nichols, G. Bertone, D. Gaggero
[Phys. Rev. D 102, 083006 \(2020\)](#), [arXiv:2002.12811](#)
 Code available [here](#) (archived on [Zenodo](#)), movies available [here](#)
 36. *Impact of substructure on local dark matter searches*
 A. Ibarra, **B. J. Kavanagh**, A. Rappelt
[JCAP 12 \(2019\) 013](#), [arXiv:1908.00747](#)
 37. *Gravitational wave probes of dark matter: challenges and opportunities*
 G. Bertone, D. Croon, M. A. Amin, K. K. Boddy, **B. J. Kavanagh**, K. J. Mack, P. Natarajan,
 T. Opferkuch, K. Schutz, V. Takhistov, C. Weniger, T.-T. Yu
[SciPost Phys. Core 3, 007 \(2020\)](#), [arXiv:1907.10610](#)
 White paper on Dark Matter and Gravitational Waves
 38. *Paleo-Detectors for Galactic Supernova Neutrinos*
 S. Baum, T. D. P. Edwards, **B. J. Kavanagh**, P. Stengel, A. K. Drukier, K. Freese, M. Górski,
 C. Weniger
[Phys. Rev. D 101, 103017 \(2020\)](#), [arXiv:1906.05800](#)
 Code available [here](#) (archived on [Zenodo](#))

39. *Discovery prospects of dwarf spheroidal galaxies for indirect dark matter searches*
S. Ando, **B. J. Kavanagh**, O. Macias, et al.
[JCAP 10 \(2019\) 040](#), [arXiv:1905.07128](#)
Completed as part of the [ITFA Amsterdam bachelors' workshop \(Jan 2019\)](#)
40. *A Unique Multi-Messenger Signal of QCD Axion Dark Matter*
T. D. P. Edwards, M. Chianese, **B. J. Kavanagh**, S. M. Nissanke, C. Weniger
[Phys. Rev. Lett. 124, 161101 \(2020\)](#), [arXiv:1905.04686](#)
Featured in [University of Amsterdam News](#)
41. *Primordial Black Holes as Silver Bullets for New Physics at the Weak Scale*
G. Bertone, A. Coogan, D. Gaggero, **B. J. Kavanagh**, C. Weniger
[Phys. Rev. D 100, 123013 \(2019\)](#), [arXiv:1905.01238](#)
Code available [here](#) (archived on [Zenodo](#))
42. *Searching for low-mass dark matter particles with a massive Ge bolometer operated above-ground*
EDELWEISS Collaboration and **B. J. Kavanagh**
[Phys. Rev. D 99, 082003 \(2019\)](#), [arXiv:1901.03588](#)
43. *Digging for Dark Matter: Spectral Analysis and Discovery Potential of Paleo-Detectors*
T. D. P. Edwards, **B. J. Kavanagh**, C. Weniger, S. Baum, A. K. Drukier, K. Freese, M. Górski, P. Stengel
[Phys. Rev. D 99, 043541 \(2019\)](#), [arXiv:1811.10549](#)
Code available [here](#) and [here](#) (archived on [Zenodo](#))
44. *Faint Light from Dark Matter: Classifying and Constraining Dark Matter-Photon Effective Operators*
B. J. Kavanagh, P. Panci, R. Ziegler
[J. High Energ. Phys. \(2019\) 2019: 89](#), [arXiv:1810.00033](#)
45. *Statistical challenges in the search for dark matter*
S. Algeri et al. (Editors: T. D. P. Edwards, **B. J. Kavanagh**, P. Scott, A. Vincent)
[arXiv:1807.09273](#)
46. *Bracketing the impact of astrophysical uncertainties on local dark matter searches*
A. Ibarra, **B. J. Kavanagh**, A. Rappelt
[JCAP 12 \(2018\) 018](#), [arXiv:1806.08714](#)
47. *Black Holes' Dark Dress: On the merger rate of a subdominant population of primordial black holes*
B. J. Kavanagh, D. Gaggero, G. Bertone
[Phys. Rev. D 98, 023536 \(2018\)](#), [arXiv:1805.09034](#)
Code available [here](#) (archived on [Zenodo](#)), movies available [here](#)
48. *Dark Matter Model or Mass, but Not Both: Assessing Near-Future Direct Searches with Benchmark-free Forecasting*
T. D. P. Edwards, **B. J. Kavanagh**, C. Weniger
[Phys. Rev. Lett. 121, 181101 \(2018\)](#), [arXiv:1805.04117](#)
Code available [here](#) and [here](#)
Featured in [University of Amsterdam News](#)
49. *Prospects for exploring New Physics in Coherent Elastic Neutrino-Nucleus Scattering*
J. Billard, J. Johnston, **B. J. Kavanagh**
[JCAP 11 \(2018\) 016](#), [arXiv:1805.01798](#)
Illustrative code available [here](#) (archived on [Zenodo](#))
50. *Precision constraints on radiative neutrino decay with CMB spectral distortion*
J. L. Aalberts, S. Ando, W. M. Borg, E. Broeils, J. Broeils, S. Broeils, **B. J. Kavanagh**, G. Leguijt, M. Reemst, D. R. van Arneman, H. Vu
[Phys. Rev. D 98, 023001 \(2018\)](#), [arXiv:1803.00588](#)
Completed as part of the [ITFA Amsterdam bachelors' workshop \(Jan 2018\)](#)

51. *Earth-Scattering of super-heavy Dark Matter: updated constraints from detectors old and new*
B. J. Kavanagh
[Phys. Rev. D 97, 123013 \(2018\)](#), [arXiv:1712.04901](#)
 Code available [here](#)
52. *Time-integrated directional detection of dark matter*
 C. A. J. O'Hare, **B. J. Kavanagh**, A. M. Green
[Phys. Rev. D 96, 083011 \(2017\)](#), [arXiv:1708.02959](#)
53. *Prospects for determining the particle/antiparticle nature of WIMP dark matter with direct detection experiments*
B. J. Kavanagh, F. S. Queiroz, W. Rodejohann, C. E. Yaguna
[J. High Energ. Phys. \(2017\) 2017: 59](#), [arXiv:1706.07819](#)
 Code available [here](#)
54. *Probing Leptophilic Dark Sectors with Hadronic Processes*
 F. D'Eramo, **B. J. Kavanagh**, P. Panci
[Phys. Lett. B 771 \(2017\) 339-348](#), [arXiv:1702.00016](#)
55. *Signatures of Earth-scattering in the direct detection of Dark Matter*
B. J. Kavanagh, R. Catena, C. Kouvaris
[JCAP 01 \(2017\) 012](#), [arXiv:1611.05453](#)
 Code available [here](#)
56. *Reconstructing the three-dimensional local dark matter velocity distribution*
B. J. Kavanagh, C. A. J. O'Hare
[Phys. Rev. D 94, 123009 \(2016\)](#), [arXiv:1609.08630](#)
57. *You can hide but you have to run: direct detection with vector mediators*
 F. D'Eramo, **B. J. Kavanagh**, P. Panci
[JHEP 08 \(2016\) 111](#), [arXiv:1605.04917](#)
 Code available [here](#)
58. *A review of the discovery reach of directional Dark Matter detection*
 F. Mayet, A. M. Green, J. B. R. Battat, J. Billard, N. Bozorgnia, G. B. Gelmini, P. Gondolo,
B. J. Kavanagh, S. K. Lee, D. Loomba J. Monroe, B. Morgan, C. A. J. O'Hare, A. H. G. Peter,
 N. S. Phan, S. E. Vahsen
[Physics Reports 627 \(2016\) 1](#), [arXiv:1602.03781](#)
 Highlighted in [Physics Reports](#)
59. *Re-examining the significance of the 750 GeV diphoton excess at ATLAS*
B. J. Kavanagh
 arXiv pre-print (2016), [arXiv:1601.07330](#)
 Featured on [Symmetries](#) and [Résonances](#)
60. *New directional signatures from the non-relativistic effective field theory of dark matter*
B. J. Kavanagh
[Phys. Rev. D 92, 023513 \(2015\)](#), [arXiv:1505.07406](#)
61. *Discretising the velocity distribution for directional dark matter experiments*
B. J. Kavanagh
[JCAP 07 \(2015\) 019](#), [arXiv:1502.04224](#)
62. *Probing WIMP particle physics and astrophysics with direct detection and neutrino telescope data*
B. J. Kavanagh, M. Fornasa, A. M. Green
[Phys. Rev. D. 91, 103533 \(2015\)](#), [arXiv:1410.8051](#)
63. *Parametrizing the local dark matter speed distribution: a detailed analysis*
B. J. Kavanagh
[Phys. Rev. D 89, 085026 \(2014\)](#), [arXiv:1312.1852](#)
64. *WIMP physics with ensembles of direct-detection experiments*
 A. H. G. Peter, V. Gluscevic, A. M. Green, **B. J. Kavanagh**, S. K. Lee
[Phys. Dark Universe 5-6 \(2014\) 45-74](#), [arXiv:1310.7039](#)

65. *Model independent determination of the dark matter mass from direct detection experiments*
B. J. Kavanagh and A. M. Green
[Phys. Rev. Lett. 111, 031302 \(2013\)](#), [arXiv:1303.6868](#)
 Featured in [Phys.org](#)
66. *Improved determination of the WIMP mass from direct detection data*
B. J. Kavanagh and A. M. Green
[Phys. Rev. D 86, 065027 \(2012\)](#), [arXiv:1207.2039](#)

White Papers

1. *The Lunar Gravitational-wave Antenna: Mission Studies and Science Case*
 P. Ajith et al. (LGWA Collaboration, including **B. J. Kavanagh**)
 Submitted to JCAP, [arXiv:2404.09181](#)
2. *Mineral Detection of Neutrinos and Dark Matter. A Whitepaper*
 S. Baum et al. (including **B. J. Kavanagh**)
[Phys. Dark Univ. 41 \(2023\) 101245](#), [arXiv:2301.07118](#)
3. *New Horizons for Fundamental Physics with LISA*
 K. G. Arun et al. (including **B. J. Kavanagh**)
[Living Reviews in Relativity, 25, 4 \(2022\)](#), [arXiv:2205.01597](#)
4. *Dark Matter In Extreme Astrophysical Environments*
 M. Baryakhtar et al. (including **B. J. Kavanagh**)
 White paper for the [SNOWMASS 2022 Summer Study](#), [arXiv:2203.07984](#)
5. *EuCAPT White Paper: Opportunities and Challenges for Theoretical Astroparticle Physics in the Next Decade*
 R. Alves Batista et al. (including **B. J. Kavanagh**, edited by G. Bertone & A. Riotto)
 White paper of the [European Consortium for Astroparticle Theory \(EuCAPT\)](#), [arXiv:2110.10074](#)
6. *AEDGE: Atomic Experiment for Dark Matter and Gravity Exploration in Space*
 Y. A. El-Neaj et al.
[EPJ Quantum Technology 7, 6 \(2020\)](#), [arXiv:1908.00802](#)
 Signed as a supporting author
7. *Black holes, gravitational waves and fundamental physics: a roadmap*
 L. Barack et al. (**B. J. Kavanagh**, Section coordinator: “Primordial Black Holes and Dark Matter”)
[Class. Quantum Grav. 36 143001 \(2019\)](#), [arXiv:1806.05195](#)
 White Paper for the COST action ”Gravitational Waves, Black Holes, and Fundamental Physics”
 Featured in [Physics World](#)