

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](#).

Publications and pre-prints

1. *Probing Benchmark Models of Hidden-Sector Dark Matter with DAMIC-M*
K. Aggarwal et al. (DAMIC-M Collaboration, including **B. J. Kavanagh**)
Submitted to PRL, [arXiv:2503.14617](#)
2. *The cosmic history of Primordial Black Hole accretion and its uncertainties*
P. Jangra, D. Gaggero, **B. J. Kavanagh**, J. M. Diego
Submitted to JCAP, [arXiv:2412.11921](#)
3. *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
Submitted to JCAP, [arXiv:2407.17599](#)
4. *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](#)
5. *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
Submitted to PRL, [arXiv:2404.08731](#)
6. *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](#))
7. *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](#)
8. *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](#)
9. *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](#)
10. *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, [arXiv:2307.07251](#)
11. *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](#)
12. *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](#)

13. *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](#)
14. *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)
15. *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](#)
16. *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](#)
17. *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](#)
18. *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)
19. *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](#)
20. *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](#))
21. *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](#)
22. *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](#)
23. *The Effect of Mission Duration on LISA Science Objectives*
P. Amaro-Seoane et al.
[Gen. Relativ. Gravit.](#) 54, 3 (2022), [arXiv:2107.09665](#)
24. *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](#)
25. *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](#))

26. *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](#)
27. *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](#)
28. *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](#)
29. *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](#)
30. *Impact of substructure on local dark matter searches*
A. Ibarra, **B. J. Kavanagh**, A. Rappelt
[JCAP 12 \(2019\) 013](#), [arXiv:1908.00747](#)
31. *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
32. *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](#))
33. *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 \(Jan 2019\)](#)
34. *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](#)
35. *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](#))
36. *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](#)
37. *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](#))

38. *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](#)
39. *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](#)
40. *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](#)
41. *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](#)
42. *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](#)
43. *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](#))
44. *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 Arneeman, H. Vu
[Phys. Rev. D 98](#), 023001 (2018), [arXiv:1803.00588](#)
Completed as part of the [ITFA Amsterdam bachelors' workshop](#) (Jan 2018)
45. *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](#)
46. *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](#)
47. *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](#)
48. *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](#)
49. *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](#)
50. *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](#)

51. *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](#)
52. *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](#)
53. *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](#)
54. *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](#)
55. *Discretising the velocity distribution for directional dark matter experiments*
B. J. Kavanagh
[JCAP 07 \(2015\) 019](#), [arXiv:1502.04224](#)
56. *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](#)
57. *Parametrizing the local dark matter speed distribution: a detailed analysis*
B. J. Kavanagh
[Phys. Rev. D 89, 085026 \(2014\)](#), [arXiv:1312.1852](#)
58. *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](#)
59. *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](#)
60. *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](#)