Employment

Professor
Department of Physics
University of Helsinki
Finland
1 Aug 2021 → present

Supervisor for doctoral programme
Doctoral Programme in Particle Physics and Universe Sciences
University of Helsinki
Finland
1 Jan 2014 → present

Professor
University of Sussex
Brighton, United Kingdom
1 Oct 1993 → present

Research output

Shallow relic gravitational wave spectrum with acoustic peak
Sharma, R., Dahl, J., Brandenburg, A. & Hindmarsh, M., 22 Dec 2023, In: Journal of Cosmology and Astroparticle Physics. 2023, 12, 23 p., 042.

Cosmology with the Laser Interferometer Space Antenna
The LISA Cosmology Working Group, Auclair, P., Bacon, D., Cutting, D., Hindmarsh, M., Hooper, D. C., Rummukainen, K. & Weir, D. J., 28 Aug 2023, In: Living reviews in relativity. 26, 1, 254 p., 5.

Multi-messenger constraints on Abelian-Higgs cosmic string networks
Hindmarsh, M. & Kume, J., Apr 2023, In: Journal of Cosmology and Astroparticle Physics. 2023, 4, 22 p., 045.

Reconstructing physical parameters from template gravitational wave spectra at LISA: first order phase transitions
Gowling, C., Hindmarsh, M., Hooper, D. C. & Torrado, J., Apr 2023, In: Journal of Cosmology and Astroparticle Physics. 2023, 4, 25 p., 061.

Prospects for LISA to detect a gravitational-wave background from first order phase transitions
Boileau, G., Christensen, N., Gowling, C., Hindmarsh, M. & Meyer, R., Feb 2023, In: Journal of Cosmology and Astroparticle Physics. 2023, 2, 24 p., 056.

Supercooling of the A phase of $^3$He
Tian, Y., Lotnyk, D., Eyal, A., Zhang, K., Zhelev, N., Abhilash, T. S., Chavez, A., Smith, E. N., Hindmarsh, M., Saunders, J., Mueller, E. & Parpia, J. M., 10 Jan 2023, In: Nature Communications. 14, 1, 9 p., 148.
Decay of acoustic turbulence in two dimensions and implications for cosmological gravitational waves
Dahl, J. I., Hindmarsh, M., Rummukainen, K. & Weir, D., 12 Sept 2022, In: Physical Review D. 106, 6, 22 p., 063511.

Generation of gravitational waves from freely decaying turbulence
Auclair, P., Caprini, C., Cutting, D., Hindmarsh, M., Rummukainen, K., Steer, D. A. & Weir, D. J., Sept 2022, In: Journal of Cosmology and Astroparticle Physics. 9, 62 p., 029.

Thermal suppression of bubble nucleation at first-order phase transitions in the early Universe
Al Ajmi, M. & Hindmarsh, M., 11 Jul 2022, In: Physical Review D. 106, 2, 12 p., 023505.

Gravitational Waves at Strong Coupling from an Effective Action
Ares, F. R., Henriksson, O., Hindmarsh, M., Hoyos, C. & Jokela, N., 1 Apr 2022, In: Physical Review Letters. 128, 13, 7 p., 131101.

Effective actions and bubble nucleation from holography
Ares, F. R., Henriksson, O., Hindmarsh, M., Hoyos, C. & Jokela, N., 29 Mar 2022, In: Physical Review D. 105, 6, 21 p., 066020.

Challenges and opportunities of gravitational-wave searches at MHz to GHz frequencies
Aggarwal, N., Aguiar, O. D., Bauswein, A., Cella, G., Clesse, S., Cruise, A. M., Domcke, V., Figueroa, D. G., Geraci, A., Goryachev, M., Grote, H., Hindmarsh, M., Muia, F., Mukund, N., Ottaway, D., Peloso, M., Quevedo, F., Ricciardone, A., Steinlechner, J., Steinlechner, S., & 5 othersSun, S., Tobar, M. E., Torrenti, F., Ünal, C. & White, G., 6 Dec 2021, In: Living reviews in relativity. 24, 1, 74 p., 4.

Observational prospects for phase transitions at LISA: Fisher matrix analysis
Gowling, C. & Hindmarsh, M., Oct 2021, In: Journal of Cosmology and Astroparticle Physics. 10, 35 p., 039.

Loop decay in Abelian-Higgs string networks
Hindmarsh, M., Lizarraga, J., Urio, A. & Urrestilla, J., 16 Aug 2021, In: Physical Review D. 104, 4, 16 p., 043519.

Approach to scaling in axion string networks
Hindmarsh, M., Lizarraga, J., Lopez-Eiguren, A. & Urrestilla, J., 26 May 2021, In: Physical Review D. 103, 10, 15 p., 103534.

Gravitational waves from a holographic phase transition
Ares, F. R., Hindmarsh, M., Hoyos, C. & Jokela, N., 12 Apr 2021, In: Journal of High Energy Physics. 4, 35 p., 100.

Gravitational waves from vacuum first-order phase transitions. II. From thin to thick walls
Cutting, D., Granados Escartin, E. S., Hindmarsh, M. & Weir, D., 25 Jan 2021, In: Physical Review D. 103, 2, 23 p., 023531.

Phase transitions in the early universe
Hindmarsh, M., Lüben, M., Lumma, J. & Pauly, M., 2021, In: SciPost physics lecture notes. 24, 61 p.

Irreducible background of gravitational waves from a cosmic defect network: Update and comparison of numerical techniques
Figueroa, D. G., Hindmarsh, M., Lizarraga, J. & Urrestilla, J., 13 Nov 2020, In: Physical Review D. 102, 10, 25 p., 103516.

Vorticity, Kinetic Energy, and Suppressed Gravitational-Wave Production in Strong First-Order Phase Transitions
Cutting, D., Hindmarsh, M. & Weir, D. J., 10 Jul 2020, In: Physical Review Letters. 125, 2, 6 p., 021302.
Detecting gravitational waves from cosmological phase transitions with LISA: an update
LISA Cosmology Working Grp, Caprini, C., Chala, M., Dorsch, G. C., Hindmarsh, M., Huber, S. J., Konstandin, T., Koziaczuk, J., Nardini, G., No, J. M., Rummukainen, K., Schwaller, P., Servant, G., Tranberg, A. & Weir, D. J., Mar 2020, In: Journal of Cosmology and Astroparticle Physics. 3, 60 p., 024.

Scaling Density of Axion Strings
Hindmarsh, M., Lizarraga, J., Lopez-Eiguren, A. & Urrestilla, J., 16 Jan 2020, In: Physical Review Letters. 124, 2, 6 p., 021301.

Gravitational waves from first order cosmological phase transitions in the Sound Shell Model
Hindmarsh, M. & Hijazi, M., Dec 2019, In: Journal of Cosmology and Astroparticle Physics. 12, 44 p., 062.

Type I Abelian Higgs strings: Evolution and cosmic microwave background constraints
Hindmarsh, M., Lizarraga, J., Urrestilla, J., Daverio, D. & Kunz, M., 26 Apr 2019, In: Physical Review D. 99, 8, 12 p., 083522.

Scaling in necklaces of monopoles and semipoles
Hindmarsh, M., Kormu, A., Lopez-Eiguren, A. & Weir, D. J., 29 Nov 2018, In: Physical Review D. 98, 10, 12 p., 103533.

Primordial black holes with an accurate QCD equation of state
Byrnes, C. T., Hindmarsh, M., Young, S. & Hawkins, M. R. S., Aug 2018, In: Journal of Cosmology and Astroparticle Physics. 2018, 8, 22 p., 041.

Gravitational waves from vacuum first-order phase transitions: From the envelope to the lattice
Cutting, D., Hindmarsh, M. & Weir, D. J., 12 Jun 2018, In: Physical Review D. 97, 12, 15 p., 123513.

Exploring cosmic origins with CORE: Inflation
CORE Collaboration, Finelli, F., Hindmarsh, M., Kiiveri, K., Väliviita, J., Kurki-Suonio, H. & Lindholm, V., Apr 2018, In: Journal of Cosmology and Astroparticle Physics. 4, 106 p., 016.

Exploring cosmic origins with CORE: Survey requirements and mission design
CORE Collaboration, Delabrouille, J., Hindmarsh, M., Keihänen, E., Kiiveri, K., Kurki-Suonio, H., Lindholm, V. & Väliviita, J., Apr 2018, In: Journal of Cosmology and Astroparticle Physics. 4, 76 p., 014.

Sound Shell Model for Acoustic Gravitational Wave Production at a First-Order Phase Transition in the Early Universe
Hindmarsh, M., 13 Feb 2018, In: Physical Review Letters. 120, 7, 5 p., 071301.

Shape of the acoustic gravitational wave power spectrum from a first order phase transition
Hindmarsh, M., Huber, S. J., Rummukainen, K. & Weir, D. J., 16 Nov 2017, In: Physical Review D. 96, 10, 17 p., 103520.

Scaling from gauge and scalar radiation in Abelian-Higgs string networks
Hindmarsh, M., Lizarraga, J., Urrestilla, J., Daverio, D. & Kunz, M., 21 Jul 2017, In: Physical Review D. 96, 2, 20 p., 023525.

Cosmic microwave background constraints for global strings and global monopoles
Lopez-Eiguren, A., Lizarraga, J., Hindmarsh, M. & Urrestilla, J., Jul 2017, In: Journal of Cosmology and Astroparticle Physics. 2017, 07, 26 p., 026.

Numerical simulations of necklaces in SU(2) gauge-Higgs field theory
Hindmarsh, M., Rummukainen, K. & Weir, D. J., 24 Mar 2017, In: Physical Review D. 95, 6, 14 p., 063520.

New Solutions for Non-Abelian Cosmic Strings
Hindmarsh, M., Rummukainen, K. & Weir, D. J., 14 Dec 2016, In: Physical Review Letters. 117, 25, 5 p., 251601.
New CMB constraints for Abelian Higgs cosmic strings
Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M. & Kunz, M., Dec 2016, In: Journal of Cosmology and Astroparticle Physics. 2016, 10, 15 p., 042.

Breaking symmetry, breaking ground
Hindmarsh, M., Oct 2016, In: Journal of Physics A: Mathematical and Theoretical. 49, 41, 3 p., 411001.

Energy-momentum correlations for Abelian Higgs cosmic strings
Daverio, D., Hindmarsh, M., Kunz, M., Lizarraga, J. & Urrestilla, J., 12 Apr 2016, In: Physical Review D. 93, 8, 22 p., 085014.

Science with the space-based interferometer eLISA. II: gravitational waves from cosmological phase transitions
Caprini, C., Hindmarsh, M., Huber, S., Konstandin, T., Kozaczuk, J., Nardini, G., No, J. M., Petiteau, A., Schwaller, P., Servant, G. & Weir, D. J., Apr 2016, In: Journal of Cosmology and Astroparticle Physics. 2016, 04, 35 p., 001.

Numerical simulations of acoustically generated gravitational waves at a first order phase transition
Hindmarsh, M., Huber, S. J., Rummukainen, K. & Weir, D. J., 22 Dec 2015, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 92, 12, 22 p., 123009.

The bispectrum of cosmic string temperature fluctuations including recombination effects
Regan, D. & Hindmarsh, M., Oct 2015, In: Journal of Cosmology and Astroparticle Physics. 10, 23 p., 030.

Dark matter with topological defects in the Inert Doublet Model
Hindmarsh, M., Kirk, R., No, J. M. & West, S. M., May 2015, In: Journal of Cosmology and Astroparticle Physics. 2015, 5, 25 p., 048.

The bispectrum of matter perturbations from cosmic strings
Regan, D. & Hindmarsh, M., Mar 2015, In: Journal of Cosmology and Astroparticle Physics. 3, 28 p., 008.

Big-bang nucleosynthesis and gamma-ray constraints on cosmic strings with a large Higgs condensate
Mota, H. F. S. & Hindmarsh, M., 2 Feb 2015, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 91, 4, 13 p., 043001.

Fitting BICEP2 with defects, primordial gravitational waves and dust
Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M., Kunz, M. & Liddle, A. R., 2015, In: Journal of Physics : Conference Series. 600, 6 p., 012025.

Gravitational waves from cosmological first order phase transitions
Hindmarsh, M., Huber, S., Rummukainen, K. & Weir, D., 2015, In: PoS Proceedings of Science. LATTICE 2015, 7 p., 233.

Constraining topological defects with temperature and polarization anisotropies
Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M., Kunz, M. & Liddle, A. R., 3 Nov 2014, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 90, 10, 9 p., 103504.

Improving cosmic string network simulations
Hindmarsh, M., Rummukainen, K., Tenkanen, T. V. I. & Weir, D. J., 29 Aug 2014, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 90, 4, 14 p., 043539.

Can Topological Defects Mimic the BICEP2 B-Mode Signal?
Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M., Kunz, M. & Liddle, A. R., 29 Apr 2014, In: Physical Review Letters. 112, 17, 3 p., 171301.
Dark matter from decaying topological defects
Hindmarsh, M., Kirk, R. & West, S. M., Mar 2014, In: Journal of Cosmology and Astroparticle Physics. 3, 21 p., 037.

Gravitational Waves from the Sound of a First Order Phase Transition
Hindmarsh, M., Huber, S. J., Rummukainen, K. & Weir, D. J., 27 Jan 2014, In: Physical Review Letters. 112, 4, 5 p., 041301.

Strictly anomaly mediated supersymmetry breaking
Hindmarsh, M. & Jones, D. R. T., 23 Apr 2013, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 87, 7 , p. 075022 18 p.

Exact Scale-Invariant Background of Gravitational Waves from Cosmic Defects
Figueroa, D. G., Hindmarsh, M. & Urrestilla, J., 6 Mar 2013, In: Physical Review Letters. 110, 10, p. 101302 5 p.

Consistent cosmology with Higgs thermal inflation in a minimal extension of the MSSM
Hindmarsh, M. & Jones, D. R. T., Mar 2013, In: Journal of Cosmology and Astroparticle Physics. 2013, 3, p. 021 29 p.

\( f(R) \) gravity from the renormalization group
Hindmarsh, M. & Saltas, I. D., 17 Sept 2012, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 86, 6, p. 064029 16 p.

Radiation and relaxation of oscillons
Salmi, P. & Hindmarsh, M., 30 Apr 2012, In: Physical Review D : Particles, Fields, Gravitation and Cosmology. 85, 8, 16 p., 085033.

Projects

Searching for Phase Transitions in the Early Universe
Hindmarsh, M.
01/10/2015 → 30/09/2019