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Will Handley

Education

2012–2016 **University of Cambridge**, *PhD: Astrophysics*, Prof. A. Lasenby & Prof. M. Hobson.

2008–2012 **University of Cambridge**, *MSci, MA: Natural Sciences*, Gonville & Caius College.

2001–2008 **Alleyn's School**, *A levels, GCSEs*, London.

Employment

Oct 2020– **Royal Society University Research Fellow**, *Cavendish Lab*, University of Cambridge.
Bayesian machine learning and tensions in cosmology

Oct 2021– **Turing Fellow**, *Alan Turing Institute*.

May 2021– **Fellow & College Lecturer**, *Gonville & Caius College*, University of Cambridge.

2016–2020 **Research fellow**, *Gonville & Caius College*, University of Cambridge.
Funded by Gonville & Caius College and an STFC IPS grant.

Jul-Sep 2016 **Postdoctoral researcher**, *Prof. H. Peiris*, University College London.
Searching for features in the primordial power spectrum.

2012–2016 **PhD: Astrophysics**, *Prof. A. Lasenby & Prof. M. Hobson*, University of Cambridge.
Kinetic initial conditions for inflation: Theory, observations & methods.

2011–2012 **Part III Dissertation**, *Prof. P. Alexander*, University of Cambridge.
Investigating the origins of cosmic magnetism.

Summer 2011 **Summer Research Student**, *Prof. M. Faulkes & Dr. J. Spencer*, Imperial College.
Folded spectrum full configuration interaction quantum Monte Carlo.

Summer 2011 **Summer Research Student**, *Dr. R. Blumenfeld*, University of Cambridge.
Geometry and field equations of granular systems.

2010–2011 **Research Review**, *Prof. S. Gull*, University of Cambridge.
Literature Survey of the Physics-Philosophy crossover field of measurement theory.

Summer 2010 **iGEM Team Physicist**, *Dr. J. Haseloff*, University of Cambridge.
E-glowli 2010 iGEM team (placed in final 6) http://2010.igem.org/Team:Cambridge

Grants won

30M CPUh ≈ £300,000 **DiRAC Resource Allocation Committee 13th call 2020**, *Next generation cosmological analysis with nested sampling*.

£722,622 **Royal Society URF 2020**, *Bayesian machine learning and tensions in cosmology*.

2M CPUh ≈ £20,000 **DiRAC directors discretionary award 2020**, *Bayesian model comparison of inflation and spatial curvature*.

£225,000 **STFC IPS 2019**, *PolyChord and Bayesian sparse facial recognition*.

£42,000 **STFC IAA 2018**, *PolyChord and Bayesian neural network facial recognition*.

£25,000 **STFC IAA 2016**, *Interfacing PolyChord 2.0*.

£15,000 **KICC Workshop 2019**, *AstroHackWeek 2019*.

$6,000 AUS	**George Southgate Visiting Fellowship 2020**, *GAMBIT visit*.
£2,000	**KICC visitors 2019**, *Likelihood free inference workshop*.
£2,000	**KICC visitors 2017**, *Class and MontePython workshop*.
£1,800	**Caius + Kavli**, *Summer 2019 student funding*.
£1,500	**King's + Kavli**, *Summer 2018 student funding*.

Awards & Prizes

Jul. 2019	Guiseppe and Vanna Cocconi Prize (WMAP and Planck)	*EPS-HEPP Division*
Jun. 2018	Gruber Prize (Planck)	*Gruber Foundation*
Dec. 2013	Best presentation	*Cavendish grad. students conference*
Jun. 2012	Best theoretical part III project	*University of Cambridge*
	Physics prize	*Gonville & Caius College*
Summer 2011	Undergraduate Research Bursary	*Nuffield Foundation*
	UROP Studentship	*Imperial College*
Summer 2010	iGEM Studentship	*Wellcome Trust*
2009–12	Junior and Senior Scholarships	*Gonville & Caius College*

Supervision of graduate students and postdoctoral researchers

Postdoc	David Yallup	*2021-present*
	Jianghui Lui	*2020*
	Kamran Javid	*2018-2019*
PhD	Ayngaran Thavanesan, Adam Ormondroyd	*2021-present*
	George Carter, Kilian Scheutwinkel, Tom Gessey-Jones	*2020-present*
	Thomas McAloone	*2020-2021*
	Ian Roque, Harry Bevins	*2019-present*
	Dominic Anstey	*2018-present*
	Fruzsina Agocs, Will Barker	*2017-2021*
	Lukas Hergt	*2017-2020*
	Ed Higson	*2016-2017*
Masters	Allahyar Sahibzada	*2021-*
	Yi-Jer Loh, Metha Prathaban	*2020-2021*
	Tom Gessey-Jones, Aleks Petrosyan, Ayngaran Thavanesan, Emma Shen	*2019-2020*
	Deaglan Bartlet, Jamie Bamber, Ian Roque	*2018-2019*
	Ward Haddadin, Jessica Rigley, Panagiotis Mavrogiannis	*2017-2018*
	Fruzsina Agocs, Robert Knighton, Stephen Pickman, Daniel Manela	*2016-2017*
Summer	Zak Shumaylov, Mattia Varrone	*2021*
	Denis Werth, Maxime Jabarian, Liam Lau	*2019*
	Elizabeth Guest, Ward Haddadin, Shu-Fan Chen	*2018*

Teaching

2021-present	Part III Physics: Relativistic Astrophysics & Cosmology	*MSci 24 lecture course*
2017-present	Bayesian Statistics	*Graduate 2 lecture course*
2020–present	Part III Physics: Relativistic astrophysics and cosmology	*Supervising*
2013–2018, 2021-present	Part II Physics: General relativity	*Supervising*

2012–2017	Part IA Mathematics for NatSci	*Supervising, Tripos classes*
2013	Part II Theoretical Physics 1 & 2	*Demonstrating*
2006–2012	Maths and Science Tuition	*Individual coaching, key stage 1 — STEP*

Academic Talks

Jul. 2021 **Success Story 2 — Optimum Sensor Placement**, *Mathematical Challenges in the Electromagnetic Environment*, Isaac Newton Institute, Cambridge, UK.

Jul. 2021 **Success Story 1 — Detecting Illicit Mesh Networks**, *Mathematical Challenges in the Electromagnetic Environment*, Isaac Newton Institute, Cambridge, UK.

Feb. 2021 **Bayesian methods for quantifying global parameter tensions between cosmological datasets**, *Tehran meeting on cosmology at the crossroads*, Tehran (remote), Iran.

Jan. 2021 **Bayesian information fusion**, *Mathematical Challenges in the Electromagnetic Environment*, Isaac Newton Institute, Cambridge (remote), UK.

Oct. 2020 **Nested Sampling: an efficient and robust Bayesian inference tool for 21cm cosmology**, *3rd Global 21-cm Workshop*, Cambridge (remote), UK.

Sep. 2020 **Nested Sampling for optimising sensor location**, *Mathematical Challenges in the Electromagnetic Environment*, Isaac Newton Institute, Cambridge (remote), UK.

Feb. 2020 **Nested Sampling: an efficient and robust Bayesian inference tool for physics and machine learning**, *Physics Colloquium*, Adelaide, Australia.

Jan. 2020 **Nested Sampling: an efficient and robust Bayesian inference tool for astrophysics and cosmology**, Oxford, UK.

Jan. 2020 **PolyChord: next generation nested sampling**, *Mathematical Challenges in the Electromagnetic Environment*, Isaac Newton Institute, Cambridge, UK.

Dec. 2019 **Quantised primordial power spectra**, *Texas 2019*, Portsmouth, UK.

Nov. 2019 **Nested Sampling: an efficient and robust Bayesian inference tool for Machine Learning and Data Science**, *CDT talk*, Cambridge, UK.

Aug. 2019 **Curvature tension: evidence for a closed universe(?)**, ICG Portsmouth, UK.

Jul. 2019 **Quantifying cosmological tensions**, University College London, UK.

Jun. 2019 **Likelihood free inference**, *GAMBIT X*, Germany.

Mar. 2019 **Compromise-free Bayesian sparse reconstruction**, *LFI workshop*, Flatiron institute, US.

Dec. 2018 **Inflation, curvature and kinetic dominance**, *Future uses of Planck data*, ESAC, Spain.

Nov. 2018 **BAMBI Resurrection: Blind Accelerated Multimodal Bayesian Inference**, *Dark Machines*, Worldwide.

Nov. 2018 **Nested Sampling: an efficient and robust Bayesian inference tool for cosmology and particle physics**, *Dark Machines*, Worldwide.

Oct. 2018 **Bayesian Statistics**, *Third Asterics-Obelics workshop*, Cambridge, UK.

May. 2018 **Planck, inflation and the future of inflationary constraints**, *Consistency of Cosmological Datasets*, Cambridge, UK.

May. 2018 **MaxEnt priors with derived parameters in a specified distribution**, Cambridge, UK.

May. 2018 **Nested Sampling: an efficient and robust Bayesian inference tool for astrophysics and cosmology**, ICIC, UK.

April. 2018 **Introduction to statistics**, *CosmoTools 18*, RWTH Aachen, Germany.

Jan. 2018 **Advances in Nested Sampling & astrophysical application**, Cambridge, UK.

Aug. 2017 **PolyChord 2.0: Fast inference & nested sampling**, *Cosmo17*, Paris, France.

Jun. 2017 **Modern Bayesian Inference: Theory and Practice**, RWTH Aachen, Germany.

Mar. 2017 **Parameter estimation and Model comparison**, *CosmoTools 17*, Madrid, Spain.

Feb. 2017 **PolyChord 2.0: Advances in Nested Sampling & astrophysical application**, Flatiron institute, US.

Sep. 2016 **PolyChord 2.0 & the future of nested sampling**, University College London, UK.

May. 2016 **PolyChord 2.0 & the future of nested sampling**, University of Sussex, UK.

Mar. 2016 **PolyChord & the future of nested sampling**, Edinburgh, UK.

Dec. 2015 **PolyChord: next generation nested sampling**, Max Planck Institute, Germany.

Feb. 2015 **PolyChord: next generation nested sampling**, University of Sussex, UK.

Dec. 2013 **Kinetic dominance in the pre-inflationary universe**, Cavendish grad. conference.

Selected Outreach

Over the course of my career I have given 19 public outreach talks including:

May 2015 **Intro. to Astronomy: Beyond the Milky Way**, *IoA Public Talk*, Cambridge.

May 2015 **To infinity and beyond: Dark Energy**, *Pint of Science*, Cambridge Brewhouse.

Feb 2014 **The Physics of Juggling**, *CCPE*, Cavendish Laboratory.

Jan 2014 **The first 3 yocto-pico seconds**, *Three minute wonder*, Cavendish Laboratory.

Institutional responsibilities

2020–present	Convener of CosmoBit	*GAMBIT*
2020–present	Leader of data analysis team	*REACH*
2021–present	Center for data-driven discovery (C2D3) steering committee	*University of Cambridge*
2019–present	Gonville & Caius College Council	*Gonville & Caius college*
2018–present	Investments committee	*Gonville & Caius college*
2016–present	Undergraduate Admissions	*Gonville & Caius college*
2018–2020	Education and research committee	*Gonville & Caius college*
2017–present	Organiser of weekly group seminars	*Cavendish astrophysics group*

Examination

Sep 2020 **Machine Learning Applied to Gaia and Other Survey Data: Applications Supporting a Polarisation Survey**, *Kyriakos Stylianiopoulos*, MPhil.

2020–2021 **Masters exam checking**, *Astrostatistics*, Part III Maths.

Organisation of scientific meetings

2020	Scientific organising committee member of 3rd Global 21-cm Workshop	*KICC*
2019	Local organising committee member of KICC 10th anniversary symposium	*KICC*
2019	Secured funding for Likelihood free inference workshop (currently organising)	*KICC*
2019	Helped secure funding and organised AstroHack week 2019	*KICC*
2018	Secured funding for and organised CLASS+MontePython software workshop	*KICC*

Peer review

Performed 55 reviews for journals including Physical Review D and Physical Review Letters;
`https://publons.com/researcher/1596769/will-handley/peer-review/`
PRD (25), MNRAS (6), JCAP (5), PRL (5), JOSS (2), APJ (2), EPJC (1), PLB (6), Entropy (2), Astronomy & Computing (1)

Collaborations

2018–present	REACH	*astro.phy.cam.ac.uk/research/research-projects/reach*

2018–present	GAMBIT	*gambit.hepforge.org*
2018–present	DarkMachines	*darkmachines.org*
2017–2018	Terra Hunter Experiment	*terrahunting.org*
2016–2017	CORE	*core-mission.org*
2015–2016	AMI	*astro.phy.cam.ac.uk/research/research-projects/AMI*
2015–2019	Planck	*cosmos.esa.int/web/planck*

Software

PolyChord	Sole author and maintainer: github.com/PolyChord/PolyChordLite
pyBAMBI	Team maintainer: github.com/DarkMachines/pyBAMBI
anesthetic	Principle author and maintainer: github.com/williamjameshandley/anesthetic
fgivenx	Sole author and maintainer: github.com/williamjameshandley/fgivenx
primordial	Sole author and maintainer: github.com/williamjameshandley/primordial
ModeCode	Maintainer: modecode.org
MultiNest	Maintainer: github.com/farhanferoz/MultiNest
Open source	scipy: Weighted kernel density estimation in scipy.stats.gaussian_kde
	matplotlib: Vertical slider in matplotlib.widgets.Slider

Interaction with industry

PolyChord	Founded start-up company PolyChord Ltd. to bring Bayesian methods & tools from cosmology to Machine Learning & Biotech industries: polychord.co.uk
AnyVision	Working collaboratively as part of STFC grant to apply Bayesian sparse reconstruction to facial recognition
Shell	Work with department postdocs in the department applying nested sampling to geophysics
DSTL	Consult for government defence research using Bayesian inference
CMAM	Consult for local finance company on Bayesian algorithmic trading

In the media

2020 **Quanta Magazine**, *Modified gravity in cosmology led by Will Barker*.
quantamagazine.org/why-is-the-universe-expanding-so-fast-20200427/

2019 **KICC annual report**, *Compromise-free Bayesian cosmology & AstroHack week*.
kicc.cam.ac.uk/aboutus/kicc-annual-report-2019

Computer skills

Programming	MPI parallelisation, C++, FORTRAN, Mathematica, Maple, Python
Computing	Unix, Bash, zsh, vim, git, svn, LaTeX, Ti*k*Z, VMs, CI
OS	Arch Linux & HPC supercomputing (Experienced), Windows & OSX (Familiar)

References

Prof. Anthony Lasenby, +44 (0)1223 337293/4, a.n.lasenby@mrao.cam.ac.uk,
Prof. Mike Hobson, +44 (0)1223 339992, mph@mrao.cam.ac.uk
Prof. Hiranya Peiris, +44 (0)203 5495831, h.peiris@ucl.ac.uk
Prof. Alan Heavens, +44 (0)207 5942930, a.heavens@imperial.ac.uk

Publications: arxiv.org/a/handley_w_1

First Author Publications

[1] **Will Handley** and Pablo Lemos. Quantifying the global parameter tensions between ACT, SPT, and Planck. *PRD*, 103(6):063529, March 2021.
[2] **Will Handley**. Primordial power spectra for curved inflating universes. *PRD*, 100(12):123517, July 2019.
[3] **Will Handley**. Curvature tension: evidence for a closed universe. *PRD*, 103:L041301, February 2021.
[4] **Will Handley** and Pablo Lemos. Quantifying tensions in cosmological parameters: Interpreting the DES evidence ratio. *PRD*, 100(4):043504, August 2019.
[5] **Will Handley** and Pablo Lemos. Quantifying dimensionality: Bayesian cosmological model complexities. *PRD*, 100(2):023512, July 2019.
[6] **Will Handley**, Anthony Lasenby, and Mike Hobson. Logolinear series expansions with applications to primordial cosmology. *PRD*, 99(12):123512, June 2019.
[7] **Will Handley**. anesthetic: nested sampling visualisation. *JOSS*, 4:1414, May 2019.
[8] **Will Handley** and Marius Millea. Maximum-Entropy Priors with Derived Parameters in a Specified Distribution. *Entropy*, 21(3):272, March 2019.
[9] **Will J. Handley**, Anthony N. Lasenby, Hiranya V. Peiris, and Michael P. Hobson. Bayesian inflationary reconstructions from Planck 2018 data. *PRD*, 100(10):103511, November 2019.
[10] **Will Handley**. fgivenx: A Python package for functional posterior plotting. *JOSS*, 3(28):849, August 2018.
[11] **W. J. Handley**, A. N. Lasenby, and M. P. Hobson. Novel quantum initial conditions for inflation. *PRD*, 94(2):024041, July 2016.
[12] **W. J. Handley**, A. N. Lasenby, and M. P. Hobson. The Runge-Kutta-Wentzel-Kramers-Brillouin Method. *arXiv*, 1612.02288, December 2016.
[13] **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. POLYCHORD: next-generation nested sampling. *MNRAS*, 453(4):4384–4398, November 2015.
[14] **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. polychord: nested sampling for cosmology. *MNRAS*, 450:L61–L65, June 2015.
[15] **W. J. Handley**, S. D. Brechet, A. N. Lasenby, and M. P. Hobson. Kinetic initial conditions for inflation. *PRD*, 89(6):063505, March 2014.

Other publications

[16] A. N. Lasenby, **W. J. Handley**, D. J. Bartlett, and C. S. Negreanu. Perturbations and the Future Conformal Boundary. *arXiv*, 2104.02521, April 2021.
[17] D. J. Bartlett, **W. J. Handley**, and A. N. Lasenby. Improved cosmological fits with quantized primordial power spectra. *arXiv*, 2104.01938, April 2021.
[18] F. J. Agocs, M. P. Hobson, **W. J. Handley**, and A. N. Lasenby. Dense output for highly oscillatory numerical solutions. *arXiv*, 2007.05013, July 2020.
[19] F. J. Agocs, **W. J. Handley**, A. N. Lasenby, and M. P. Hobson. Efficient method for solving highly oscillatory ordinary differential equations with applications to physical systems. *Physical Review Research*, 2(1):013030, January 2020.
[20] F. J. Agocs, L. T. Hergt, **W. J. Handley**, A. N. Lasenby, and M. P. Hobson. Quantum initial conditions for inflation and canonical invariance. *PRD*, 102(2):023507, July 2020.
[21] L. T. Hergt, **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. Bayesian evidence for the tensor-to-scalar ratio r and neutrino masses m_ν : Effects of uniform versus logarithmic priors. *PRD*, 103(12):123511, June 2021.
[22] L. T. Hergt, **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. Case for kinetically dominated initial conditions for inflation. *PRD*, 100(2):023502, July 2019.
[23] L. T. Hergt, **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. Constraining the kinetically dominated universe. *PRD*, 100(2):023501, July 2019.
[24] Ayngaran Thavanesan, Denis Werth, and **Will Handley**. Analytical approximations for curved primordial power spectra. *PRD*, 103(2):023519, January 2021.
[25] T. Gessey-Jones and **W. J. Handley**. Constraining Quantum Initial Conditions before Inflation. *arXiv*, 2104.03016, April 2021.
[26] Jamie Bamber and **Will Handley**. Beyond the Runge-Kutta-Wentzel-Kramers-Brillouin method. *PRD*, 101(4):043517, February 2020.
[27] W. I. J. Haddadin and **W. J. Handley**. Rapid numerical solutions for the Mukhanov-Sasaki equation. *PRD*, 103(12):123513, June 2021.
[28] W. E. V. Barker, A. N. Lasenby, M. P. Hobson, and **W. J. Handley**. Nonlinear Hamiltonian analysis of new quadratic torsion theories Part I. Cases with curvature-free constraints. *arXiv*, 2101.02645, January 2021.
[29] W. E. V. Barker, A. N. Lasenby, M. P. Hobson, and **W. J. Handley**. Systematic study of background cosmology in unitary Poincaré gauge theories with application to emergent dark radiation and H_0 tension. *PRD*, 102(2):024048, July 2020.
[30] W. E. V. Barker, A. N. Lasenby, M. P. Hobson, and **W. J. Handley**. Mapping Poincaré gauge cosmology to Horndeski theory for emergent dark energy. *PRD*, 102(8):084002, October 2020.
[31] W. E. V. Barker, A. N. Lasenby, M. P. Hobson, and **W. J. Handley**. Static energetics in gravity. *JMAP*, 60(5):052504, May 2019.
[32] Dominic Anstey, Eloy de Lera Acedo, and **Will Handley**. A General Bayesian Framework for Foreground Modelling and Chromaticity Correction for Global 21cm Experiments. *arXiv*, 2010.09644, October 2020.
[33] Dominic Anstey, John Cumner, Eloy de Lera Acedo, and **Will Handley**. Informing antenna design for sky-averaged 21-cm experiments using a simulated Bayesian data analysis pipeline. *arXiv*, 2106.10193, June 2021.

[34] H. T. J. Bevins, **W. J. Handley**, A. Fialkov, E. de Lera Acedo, and K. Javid. GLOBALEMU: A novel and robust approach for emulating the sky-averaged 21-cm signal from the cosmic dawn and epoch of reionisation. *arXiv*, 2104.04336, April 2021.
[35] H. T. J. Bevins, **W. J. Handley**, A. Fialkov, E. de Lera Acedo, L. J. Greenhill, and D. C. Price. MAXSMOOTH: rapid maximally smooth function fitting with applications in Global 21-cm cosmology. *MNRAS*, 502(3):4405–4425, April 2021.
[36] Emma Shen, Dominic Anstey, Eloy de Lera Acedo, Anastasia Fialkov, and **Will Handley**. Quantifying ionospheric effects on global 21-cm observations. *MNRAS*, 503(1):344–353, May 2021.
[37] I. L. V. Roque, **W. J. Handley**, and N. Razavi-Ghods. Bayesian noise wave calibration for 21-cm global experiments. *MNRAS*, May 2021.
[38] Pablo Lemos, Fabian Köhlinger, **Will Handley**, Benjamin Joachimi, Lorne Whiteway, and Ofer Lahav. Quantifying Suspiciousness within correlated data sets. *MNRAS*, 496(4):4647–4653, August 2020.
[39] B. Joachimi, F. Köhlinger, **W. Handley**, and P. Lemos. When tension is just a fluctuation. How noisy data affect model comparison. *A&A*, 647:L5, March 2021.
[40] The GAMBIT Collaboration. Thermal WIMPs and the Scale of New Physics: Global Fits of Dirac Dark Matter Effective Field Theories. *arXiv*, 2106.02056, June 2021.
[41] Gambit Cosmology Workgroup. Strengthening the bound on the mass of the lightest neutrino with terrestrial and cosmological experiments. *PRD*, 103(12):123508, June 2021.
[42] GAMBIT Cosmology Workgroup. CosmoBit: a GAMBIT module for computing cosmological observables and likelihoods. *JCAP*, 2021(2):022, February 2021.
[43] GAMBIT Collaboration et al. Simple and statistically sound strategies for analysing physical theories. *arXiv*, 2012.09874, December 2020.
[44] Andrew Fowlie, Sebastian Hoof, and **Will Handley**. Nested sampling for frequentist computation: fast estimation of small p-values. *arXiv*, 2105.13923, May 2021.
[45] Andrew Fowlie, **Will Handley**, and Liangliang Su. Nested sampling with plateaus. *MNRAS*, 503(1):1199–1205, May 2021.
[46] Andrew Fowlie, **Will Handley**, and Liangliang Su. Nested sampling cross-checks using order statistics. *MNRAS*, 497(4):5256–5263, October 2020.
[47] Justin Alsing and **Will Handley**. Nested sampling with any prior you like. *arXiv*, 2102.12478, February 2021.
[48] Kamran Javid, **Will Handley**, Mike Hobson, and Anthony Lasenby. Compromise-free Bayesian neural networks. *arXiv*, 2004.12211, April 2020.
[49] Edward Higson, **Will Handley**, Mike Hobson, and Anthony Lasenby. Dynamic nested sampling: an improved algorithm for parameter estimation and evidence calculation. *Statistics and Computing*, 29(5):891–913, September 2019.
[50] Edward Higson, **Will Handley**, Michael Hobson, and Anthony Lasenby. Bayesian sparse reconstruction: a brute-force approach to astronomical imaging and machine learning. *MNRAS*, 483(4):4828–4846, March 2019.
[51] Edward Higson, **Will Handley**, Michael Hobson, and Anthony Lasenby. NESTCHECK: diagnostic tests for nested sampling calculations. *MNRAS*, 483(2):2044–2056, February 2019.
[52] Edward Higson, **Will Handley**, Mike Hobson, and Anthony Lasenby. Sampling Errors in Nested Sampling Parameter Estimation. *Bayesian Analysis*, 13(3):873–896, March 2018.
[53] E. Ahrer, D. Queloz, V. M. Rajpaul, D. Ségransan, F. Bouchy, R. Hall, **W. Handley**, C. Lovis, M. Mayor, A. Mortier, F. Pepe, S. Thompson, S. Udry, and N. Unger. The HARPS search for southern extra-solar planets - XLV. Two Neptune mass planets orbiting HD 13808: a study of stellar activity modelling's impact on planet detection. *MNRAS*, 503(1):1248–1263, May 2021.
[54] F. Lienhard, D. Queloz, M. Gillon, A. Burdanov, L. Delrez, E. Ducrot, **W. Handley**, E. Jehin, C. A. Murray, A. H. M. J. Triaud, E. Gillen, A. Mortier, and B. V. Rackham. Global analysis of the TRAPPIST Ultra-Cool Dwarf Transit Survey. *MNRAS*, 497(3):3790–3808, September 2020.
[55] Richard D. Hall, Samantha J. Thompson, **Will Handley**, and Didier Queloz. On the Feasibility of Intense Radial Velocity Surveys for Earth-Twin Discoveries. *MNRAS*, 479(3):2968–2987, September 2018.
[56] The DarkMachines High Dimensional Sampling Group. A comparison of optimisation algorithms for high-dimensional particle and astrophysics applications. *arXiv*, 2101.04525, January 2021.
[57] Ethan Carragher, **Will Handley**, Daniel Murnane, Peter Stangl, Wei Su, Martin White, and Anthony G. Williams. Convergent Bayesian global fits of 4D composite Higgs models. *Journal of High Energy Physics*, 2021(5):237, May 2021.
[58] A. J. K. Chua, S. Hee, **W. J. Handley**, E. Higson, C. J. Moore, J. R. Gair, M. P. Hobson, and A. N. Lasenby. Towards a framework for testing general relativity with extreme-mass-ratio-inspiral observations. *MNRAS*, 478(1):28–40, July 2018.
[59] S. Hee, J. A. Vázquez, **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. Constraining the dark energy equation of state using Bayes theorem and the Kullback-Leibler divergence. *MNRAS*, 466(1):369–377, April 2017.
[60] S. Hee, **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. Bayesian model selection without evidences: application to the dark energy equation-of-state. *MNRAS*, 455(3):2461–2473, January 2016.
[61] Gong-Bo Zhao, Marco Raveri, Levon Pogosian, Yuting Wang, Robert G. Crittenden, **Will J. Handley**, Will J. Percival, Florian Beutler, Jonathan Brinkmann, Chia-Hsun Chuang, Antonio J. Cuesta, Daniel J. Eisenstein, Francisco-Shu Kitaura, Kazuya Koyama, Benjamin L'Huillier, Robert C. Nichol, Matthew M. Pieri, Sergio Rodriguez-Torres, Ashley J. Ross, Graziano Rossi, Ariel G. Sánchez, Arman Shafieloo, Jeremy L. Tinker, Rita

Tojeiro, Jose A. Vazquez, and Hanyu Zhang. Dynamical dark energy in light of the latest observations. *Nature Astronomy*, 1:627–632, August 2017.
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[63] James S. Spencer, Nick S. Blunt, Seonghoon Choi, Jiri Etrych, Maria-Andreea Filip, W. M. C. Foulkes, Ruth S. T. Franklin, **Will J. Handley**, Fionn D. Malone, Verena A. Neufeld, Roberto Di Remigio, Thomas W. Rogers, Charles J. C. Scott, James J. Shepherd, William A. Vigor, Joseph Weston, RuQing Xu, and Alex J. W. Thom. The HANDE-QMC project: open-source stochastic quantum chemistry from the ground state up. *Journal of Chemical Theory and Computation*, 15(3):1728–1742, January 2019.

CORE Collaboration

[64] Exploring cosmic origins with CORE: B-mode component separation. *JCAP*, 2018(4):023, April 2018.
[65] Exploring cosmic origins with CORE: Mitigation of systematic effects. *JCAP*, 2018(4):022, April 2018.
[66] Exploring cosmic origins with CORE: Effects of observer peculiar motion. *JCAP*, 2018(4):021, April 2018.
[67] Exploring cosmic origins with CORE: Extragalactic sources in cosmic microwave background maps. *JCAP*, 2018(4):020, April 2018.
[68] Exploring cosmic origins with CORE: Cluster science. *JCAP*, 2018(4):019, April 2018.
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