Will Handley

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Education

2012–2016	**University of Cambridge**, *Ph.D. 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 **Ph.D. 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 (£1.5m)

£169,748	**Royal Society Enhancement**, *Likelihood-free inference and Bayesian neural networks*
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	*2018-19*
Ph.D.	Ayngaran Thavanesan, Adam Ormondroyd	*2021-present*
	George Carter, Kilian Scheutwinkel, Thomas Gessey-Jones	*2020-present*
	Thomas McAloone	*2020-21*
	Isidro Gómez Vargas	*2020*
	Ian Roque, Harry Bevins	*2019-present*
	Dominic Anstey	*2018-present*
	Fruzsina Agocs, Will Barker	*2017-21*
	Lukas Hergt	*2017-20*
	Ed Higson	*2016-17*
Masters	Sam Leeney	*2022-*
	Allahyar Sahibzada, Yoann Launay, Oliver Normand, Xy Wang, Carola Zanoletti	*2021-22*
	Yi Jer Loh, Metha Prathaban	*2020-21*
	Thomas Gessey-Jones, Aleks Petrosyan, Ayngaran Thavanesan, Emma Shen	*2019-20*
	Deaglan Bartlet, Jamie Bamber, Ian Roque	*2018-19*
	Ward Haddadin, Jessica Rigley, Panagiotis Mavrogiannis	*2017-18*
	Fruzsina Agocs, Robert Knighton, Stephen Pickman, Daniel Manela	*2016-17*
Summer	Mary Letey, Beichen Xu, Artyom Baryshnikov	*2022*
	Zak Shumaylov, Mattia Varrone	*2021*
	Denis Werth, Maxime Jabarian, Liam Lau	*2019*
	Elizabeth Guest, Ward Haddadin, Shu-Fan Chen	*2018*

Lecturing

2021-present	Part III Physics: Relativistic Astrophysics & Cosmology	*MSci 24 lecture course*

2017-present	Bayesian Statistics	*Graduate 2 lecture course*

Small group teaching

2020–present	Part III Physics: Relativistic Astrophysics and Cosmology	*Supervising (24 hours)*
2013–2018, 2021-present	Part II Physics: General relativity	*Supervising (136 hours)*
2012–2017	Part IA Mathematics for NatSci	*Tripos classes (20 hours),Supervising (580 hours)*
2015-2016	Part IA Physics	*Supervising (20 hours)*
2013	Part II Theoretical Physics 1 & 2	*Demonstrating (8 hours)*
2006–2012	Maths and Science Tuition	*Individual coaching, key stage 1 – STEP*

Academic Talks   † = remote

Apr. 2022	**Nested Sampling and Likelihood-free inference**, *Likelihood-free in Paris* , Paris, France
Apr. 2022	**Statistical methods in Cosmology**, *Obs. and Theor. 21-cm Cosmology* , Cambridge, UK
Jan. 2022	**PolyChord: Next generation nested sampling**, *UK Atomic Energy Authority*, UK†
Nov. 2021	**Review on Statistical Tools and Samplers**, *TOOLS 2021*, IP2I, Lyon, France†
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
Mar. 2021	**PolyChord: Novel Bayesian Machine Learning**, *Cambridge Data Science Fair*, 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*
2022–present	Visitor and Lecturer committee	*KICC*
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

Dec 2021	**High-resolution CMB bispectrum estimator**, *Wu Hyun Sohn*, Ph.D.
Sep 2020	**Machine Learning Applied to Gaia and Other Survey Data: Applications Supporting a Polarisation Survey**, *Kyriakos Stylianiopoulos*, MPhil
2020–	**Masters exam checking**, *Astrostatistics*, Part III Maths

2021–2022 **Exam setting**, *Relativistic Astrophysics and Cosmology*, Part III Physics

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 60 reviews for journals including Physical Review D and Physical Review Letters;
`https://publons.com/researcher/1596769/will-handley/peer-review/`
PRD (28), MNRAS (6), JCAP (5), PRL (6), JOSS (2), APJ (2), EPJC (1), PLB (6), Entropy (2), Astronomy & Computing (2)

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

2022 **BBC Radio 4**, *The Third Degree*, Astrophysics Don
"Students vs Dons" BBC radio quiz to be aired in Jun/July

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, TikZ, 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
Prof. Julien Lesgourgues, +49 241 80 25724, lesgourg@physik.rwth-aachen.de

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**. Curvature tension: Evidence for a closed universe. *PRD*, 103(4):L041301, February 2021.
[3] **Will Handley**. Primordial power spectra for curved inflating universes. *PRD*, 100(12):123517, July 2019.
[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] Greg Ashton, Noam Bernstein, Johannes Buchner, Xi Chen, Gábor Csányi, Farhan Feroz, Andrew Fowlie, Matthew Griffiths, Michael Habeck, **Will Handley**, Edward Higson, Michael Hobson, Anthony Lasenby, David Parkinson, Livia B. Pártay, Matthew Pitkin, Doris Schneider, Leah South, Joshua S. Speagle, John Veitch, Philipp Wacker, David J Wales, and David Yallup. Nested Sampling for physical scientists. *Nature Reviews Physics (In press)*, May 2022.
[17] E. de Lera Acedo, D.I.L. de Villiers, N. Razavi-Ghods, **W. Handley**, A. Fialkov, A. Magro, D. Anstey, H.T.J. Bevins, R. Chiello, J. Cumner, A.T. Josaitis, I.L.V. Roque, P.H. Sims, P. Alexander, G. Bernardi, S. Carey, J. Cavillot, W. Croukamp, J.A. Ely, T. Gessey-Jones, Q. Gueuning, R. Hills, G. Kulkarni, R. Maiolino, P. D. Meerburg, S. Mittal, J.R. Pritchard, E. Puchwein, A. Saxena, K.H. Scheutwinkel, E. Shen, O. Smirnov, M. Spinelli,

and K. Zarb-Adami. REACH: Radio Experiment for the Analysis of Cosmic Hydrogen. *Nature Astronomy (In press)*, May 2022.

[18] Andrew Fowlie, Sebastian Hoof, and **Will Handley**. Nested Sampling for Frequentist Computation: Fast Estimation of Small p -Values. *PRL*, 128(2):021801, January 2022.

[19] 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.

[20] A. N. Lasenby, **W. J. Handley**, D. J. Bartlett, and C. S. Negreanu. Perturbations and the Future Conformal Boundary. *arXiv*, 2104.02521, April 2021.

[21] D. J. Bartlett, **W. J. Handley**, and A. N. Lasenby. Improved cosmological fits with quantized primordial power spectra. *arXiv*, 2104.01938, April 2021.

[22] Metha Prathaban and **Will Handley**. Rescuing Palindromic Universes with Improved Recombination Modelling. *arXiv*, 2111.14588, November 2021.

[23] 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.

[24] 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.

[25] 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.

[26] 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.

[27] 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.

[28] L. T. Hergt, **W. J. Handley**, M. P. Hobson, and A. N. Lasenby. Constraining the kinetically dominated universe. *PRD*, 100(2):023501, July 2019.

[29] Ayngaran Thavanesan, Denis Werth, and **Will Handley**. Analytical approximations for curved primordial power spectra. *PRD*, 103(2):023519, January 2021.

[30] Zakhar Shumaylov and **Will Handley**. Primordial power spectra from k-inflation with curvature. *arXiv*, 2112.07547, December 2021.

[31] T. Gessey-Jones and **W. J. Handley**. Constraining quantum initial conditions before inflation. *PRD*, 104(6):063532, September 2021.

[32] Jamie Bamber and **Will Handley**. Beyond the Runge-Kutta-Wentzel-Kramers-Brillouin method. *PRD*, 101(4):043517, February 2020.

[33] W. I. J. Haddadin and **W. J. Handley**. Rapid numerical solutions for the Mukhanov-Sasaki equation. *PRD*, 103(12):123513, June 2021.

[34] W. E. V. Barker, A. N. Lasenby, M. P. Hobson, and **W. J. Handley**. Nonlinear Hamiltonian analysis of new quadratic torsion theories: Cases with curvature-free constraints. *PRD*, 104(8):084036, October 2021.

[35] 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.

[36] 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.

[37] W. E. V. Barker, A. N. Lasenby, M. P. Hobson, and **W. J. Handley**. Static energetics in gravity. *JMAP*, 60(5):052504, May 2019.

[38] Dominic Anstey, Eloy de Lera Acedo, and **Will Handley**. A general Bayesian framework for foreground modelling and chromaticity correction for global 21 cm experiments. *MNRAS*, 506(2):2041–2058, September 2021.

[39] 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. *MNRAS*, 509(4):4679–4693, February 2022.

[40] 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 reionization. *MNRAS*, 508(2):2923–2936, December 2021.

[41] 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.

[42] H. T. J. Bevins, E. de Lera Acedo, A. Fialkov, **W. J. Handley**, S. Singh, R. Subrahmanyan, and R. Barkana. A Comprehensive Bayesian re-analysis of the SARAS2 data from the Epoch of Reionization. *arXiv*, 2201.11531, January 2022.

[43] 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.

[44] I. L. V. Roque, **W. J. Handley**, and N. Razavi-Ghods. Bayesian noise wave calibration for 21-cm global experiments. *MNRAS*, 505(2):2638–2646, August 2021.

[45] J. Cumner, E. de Lera Acedo, D. I. L. de Villiers, D. Anstey, C. I. Kolitsidas, B. Gurdon, N. Fagnoni, P. Alexander, G. Bernardi, H. T. J. Bevins, S. Carey, J. Cavillot, R. Chiello, C. Craeye, W. Croukamp, J. A. Ely, A. Fialkov, T. Gessey-Jones, Q. Gueuning, **W. Handley**, R. Hills, A. T. Josaitis, G. Kulkarni, A. Magro, R. Maiolino, P. D. Meerburg, S. Mittal, J. R. Pritchard, E. Puchwein, N. Razavi-Ghods, I. L. V. Roque, A. Saxena, K. H. Scheutwinkel, E. Shen, P. H. Sims, O. Smirnov, M. Spinelli, and K. Zarb-Adami. Radio Antenna Design for Sky-Averaged 21cm Cosmology Experiments: The REACH Case. *Journal of Astronomical Instrumentation*, 11(1):2250001–2058, January 2022.

[46] K. H. Scheutwinkel, **W. Handley**, and E. de Lera Acedo. Bayesian evidence-driven likelihood selection for sky-averaged 21-cm signal extraction. *arXiv*, 2204.04491, April 2022.

[47] K. H. Scheutwinkel, E. de Lera Acedo, and **W. Handley**. Bayesian evidence-driven diagnosis of instrumental systematics for sky-averaged 21-cm cosmology experiments. *arXiv*, 2204.04445, April 2022.

[48] T. Gessey-Jones, N. S. Sartorio, A. Fialkov, G. M. Mirouh, M. Magg, E. de Lera Acedo, **W. J. Handley**, and R. Barkana. Impact of the Primordial Stellar Initial Mass Function on the 21-cm Signal. *arXiv*, 2202.02099, February 2022.

[49] 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.

[50] 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.

[51] Gambit Collaboration. Thermal WIMPs and the scale of new physics: global fits of Dirac dark matter effective field theories. *European Physical Journal C*, 81(11):992, November 2021.

[52] Gambit Cosmology Workgroup. Strengthening the bound on the mass of the lightest neutrino with terrestrial and cosmological experiments. *PRD*, 103(12):123508, June 2021.

[53] GAMBIT Cosmology Workgroup. CosmoBit: a GAMBIT module for computing cosmological observables and likelihoods. *JCAP*, 2021(2):022, February 2021.

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