

Gonville & Caius College  
Cambridge, UK, CB2 1TA  
☎ +44 (0) 7718 622713  
☎ +44 (0) 1223 767893  
✉ wh260@cam.ac.uk

📄 [www.kicc.cam.ac.uk/directory/wh260](http://www.kicc.cam.ac.uk/directory/wh260)  
[orcid.org/0000-0002-5866-0445](http://orcid.org/0000-0002-5866-0445)

# Will Handley

## Education

- 2012–2016 **University of Cambridge**, *PhD: Astrophysics*, Prof. A. Lasenby & Prof. M. Hobson.  
2008–2012 **University of Cambridge**, *Msc, MA: Natural Sciences*, Gonville & Caius College.  
2001–2008 **Alleyn's School**, *A levels, GCSEs*, London.

## Research Experience

- 2016–present **Research fellow**, *Gonville & Caius College*, University of Cambridge.  
Jul-Sep 2016 **Postdoctoral position**, *Prof. H. Peiris*, University College London.  
Searching for features in the primordial power spectrum.  
Apr-Jul 2016 **Research Associate**, University of Cambridge.  
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>

## Awards & Prizes

- |             |                                      |                                     |
|-------------|--------------------------------------|-------------------------------------|
| Jun. 2018   | Gruber Prize (co-shared with 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            |

## Teaching

- 2017–present Bayesian Statistics Graduate lecture course  
2013–2018 Part II Physics: General relativity Supervising  
2012–2017 Part IA Mathematics for NatSci Supervising, Tripos classes

2013 Part II Theoretical Physics 1 & 2  
2006–2012 Maths and Science Tuition

*Demonstrating*  
*Individual coaching, key stage 1 — STEP*

## Supervision of graduate students and postdoctoral fellows

Post-Doc	Kamran Javid	2018-present
PhD	Ed Higson, Lukas Hergt, Fruzsina Agocs, Will Barker	2016-present
Masters	Deaglan Bartlet, Jamie Bamber	2018-present
	Ward Haddadin, Jessica Rigley, Panagiotis Mavrogiannis	2017-2018
	Fruzsina Agocs, Robert Knighton, Stephen Pickman, Daniel Manela	2016–2017
Summer	Elizabeth Guest, Ward Haddadin, Shu-Fan Chen	2018

## Grants won

£25,000	<b>STFC IAA 2016</b> , <i>Interfacing PolyChord 2.0</i> .
£2,000	<b>KICC visitors 2017</b> , <i>Class and MontePython workshop</i> .
£42,000	<b>STFC IAA 2018</b> , <i>PolyChord and Bayesian Neural network recognition</i> .
£1,500	<b>King's + Kavli</b> , <i>Summer student funding</i> .
£15,000	<b>KICC Workshop 2019</b> , <i>AstroHack week 2019</i> .

## Academic Talks

Nov. 2018	<b>BAMBI Resurrection: Blind Accelerated Multimodal Bayesian Inference</b> , <i>Dark Machines</i> , Worldwide.
Nov. 2018	<b>Nested Sampling: an efficient and robust Bayesian inference tool for cosmology and particle physics</b> , <i>Dark Machines</i> , Worldwide.
Oct. 2018	<b>Bayesian Statistics</b> , <i>Third Asterics-Obelics workshop</i> , Cambridge, UK.
May. 2018	<b>Planck, inflation and the future of inflationary constraints</b> , <i>Consistency of Cosmological Datasets</i> , Cambridge, UK.
May. 2018	<b>MaxEnt priors with derived parameters in a specified distribution</b> , Cambridge, UK.
May. 2018	<b>Nested Sampling: an efficient and robust Bayesian inference tool for astrophysics and cosmology</b> , ICIC, UK.
April. 2018	<b>Introduction to statistics</b> , <i>CosmoTools 18</i> , RWTH Aachen, Germany.
Jan. 2018	<b>Advances in Nested Sampling &amp; astrophysical application</b> , Cambridge, UK.
Aug. 2017	<b>PolyChord 2.0: Fast inference &amp; nested sampling</b> , <i>Cosmo17</i> , Paris, France.
Jun. 2017	<b>Modern Bayesian Inference: Theory and Practice</b> , RWTH Aachen, Germany.
Mar. 2017	<b>Parameter estimation and Model comparison</b> , <i>CosmoTools 17</i> , Madrid, Spain.
Feb. 2017	<b>PolyChord 2.0: Advances in Nested Sampling &amp; astrophysical application</b> , CCA, US.
Sep. 2016	<b>PolyChord 2.0 &amp; the future of nested sampling</b> , University College London, UK.
May. 2016	<b>PolyChord 2.0 &amp; the future of nested sampling</b> , University of Sussex, UK.
Mar. 2016	<b>PolyChord &amp; the future of nested sampling</b> , Edinburgh, UK.
Dec. 2015	<b>PolyChord: next generation nested sampling</b> , Max Planck Institute, Germany.
Feb. 2015	<b>PolyChord: next generation nested sampling</b> , University of Sussex, UK.
Dec. 2013	<b>Kinetic dominance in the pre-inflationary universe</b> , Cavendish grad. conference.

## Selected Outreach

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

May 2015	<b>Intro. to Astronomy: Beyond the Milky Way</b> , <i>IoA Public Talk</i> , Cambridge.
----------	--

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

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

## Institutional responsibilities

2017–present	Organiser of internal weekly group seminars	<i>Cavendish astrophysics group</i>
2018–present	Education and research committee	<i>Gonville &amp; Caius college</i>
2018–present	Investments committee	<i>Gonville &amp; Caius college</i>
2016–present	Undergraduate Admissions	<i>Gonville &amp; Caius college</i>

## Organisation of scientific meetings

2018	Secured funding for and organised CLASS+MontePython software workshop	<i>KICC</i>
2019	Secured funding for AstroHack week 2019	<i>KICC</i>

## Collaborations

2018–present	GAMBIT	<i><a href="http://gambit.hepforge.org">gambit.hepforge.org</a></i>
2018–present	DarkMachines	<i><a href="http://darkmachines.org">darkmachines.org</a></i>
2017–present	Terra Hunter Experiment	<i><a href="http://terrahunting.org">terrahunting.org</a></i>
2016–2017	CORE	<i><a href="http://core-mission.org">core-mission.org</a></i>
2015–2016	AMI	<i><a href="http://mrao.cam.ac.uk/outreach/radio-telescopes/ami">mrao.cam.ac.uk/outreach/radio-telescopes/ami</a></i>
2015–2018	Planck	<i><a href="http://cosmos.esa.int/web/planck">cosmos.esa.int/web/planck</a></i>

## Software

PolyChord	Sole author and maintainer: <a href="https://github.com/PolyChord/PolyChordLite">github.com/PolyChord/PolyChordLite</a>
pyBAMBI	Team maintainer: <a href="https://github.com/DarkMachines/pyBAMBI">github.com/DarkMachines/pyBAMBI</a>
fgivenx	Sole author and maintainer: <a href="https://github.com/williamjameshandley/fgivenx">github.com/williamjameshandley/fgivenx</a>
ModeCode	Maintainer: <a href="http://modecode.org">modecode.org</a>
MultiNest	Maintainer: <a href="https://github.com/farhanferoz/MultiNest">github.com/farhanferoz/MultiNest</a>
Open source	scipy: Weighted kernel density estimation in <code>scipy.stats.gaussian_kde</code> matplotlib: Vertical slider in <code>matplotlib.widgets.Slider</code>

## Interaction with industry

PolyChord	Founded start-up company PolyChord Ltd. to bring Bayesian methods & tools from cosmology to Machine Learning & Biotech industries: <a href="http://polychord.co.uk">polychord.co.uk</a>
Shell	Work with department postdocs in the department applying nested sampling to geophysics
Tesco	Consultancy work applying Bayesian inference to supply-chain management
CMAM	Consult for local finance company on Bayesian algorithmic trading

## Computer skills

Programming	MPI parallelisation, C++, FORTRAN, Mathematica, Maple, Python
Computing	Unix, Bash, zsh, vim, git, svn, $\text{\LaTeX}$ , TikZ, VMs
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](mailto:a.n.lasenby@mrao.cam.ac.uk),  
Prof. Mike Hobson, +44 (0)1223 339992, [mph@mrao.cam.ac.uk](mailto:mph@mrao.cam.ac.uk)  
Prof. Hiranya Peiris, +44 (0)203 5495831, [h.peiris@ucl.ac.uk](mailto:h.peiris@ucl.ac.uk)

## Publications

- [1] W. Handley, M. Hobson, and A. Lasenby, MNRAS **453**, 4384 (2015), arXiv:1506.00171 .
- [2] W. Handley, M. Hobson, and A. Lasenby, MNRAS **450**, L61 (2015), arXiv:1502.01856 .
- [3] W. J. Handley, M. P. Hobson, and A. N. Lasenby, ASCL (2015), ascl:1502.011 .
- [4] W. Handley, S. Brechet, A. Lasenby, and M. Hobson, PRD **89**, 063505 (2014), arXiv:1401.2253 .
- [5] W. Handley, A. Lasenby, and M. Hobson, arXiv (2016), arXiv:1612.02288 .
- [6] W. Handley, A. Lasenby, and M. Hobson, PRD **94**, 024041 (2016), arXiv:1607.04148 .
- [7] W. Handley and M. Millea, ArXiv e-prints , arXiv:1804.08143 (2018), arXiv:1804.08143 .
- [8] W. Handley, The Journal of Open Source Software **3** (2018), 10.21105/joss.00849.
- [9] W. E. Barker, A. N. Lasenby, M. P. Hobson, and W. J. Handley, ArXiv e-prints (2018), 1811.09844 .
- [10] R. D. Hall, S. J. Thompson, W. Handley, and D. Queloz, MNRAS **479**, 2968 (2018).
- [11] W. I. J. Haddadin and W. J. Handley, ArXiv e-prints (2018), 1809.11095 .
- [12] L. T. Hergt, W. J. Handley, M. P. Hobson, and A. N. Lasenby, ArXiv e-prints (2018), 1809.07737 .
- [13] L. T. Hergt, W. J. Handley, M. P. Hobson, and A. N. Lasenby, ArXiv e-prints (2018), 1809.07185 .
- [14] E. Higson, W. Handley, M. Hobson, and A. Lasenby, ArXiv e-prints (2018), 1809.04598 .
- [15] A. J. K. Chua, S. Hee, W. J. Handley, E. Higson, C. J. Moore, J. R. Gair, M. P. Hobson, and A. N. Lasenby, MNRAS **478**, 28 (2018).
- [16] E. Higson, W. Handley, M. Hobson, and A. Lasenby, ArXiv e-prints (2018), 1804.06406 .
- [17] G.-B. Zhao, M. Raveri, L. Pogosian, Y. Wang, R. G. Crittenden, W. J. Handley, and et al., Nature Astronomy **1**, 627 (2017).
- [18] S. Hee, J. A. Vázquez, W. J. Handley, M. P. Hobson, and A. N. Lasenby, MNRAS **466**, 369 (2017).
- [19] E. Higson, W. Handley, M. Hobson, and A. Lasenby, ArXiv e-prints (2017), 1704.03459 .
- [20] E. Higson, W. Handley, M. Hobson, and A. Lasenby, ArXiv e-prints (2017), 1703.09701 .
- [21] C. Rumsey, M. Olamaie, Y. C. Perrott, H. R. Russell, F. Feroz, K. J. B. Grainge, W. J. Handley, M. P. Hobson, R. D. E. Saunders, and M. P. Schammel, MNRAS **460**, 569 (2016).
- [22] S. Hee, W. J. Handley, M. P. Hobson, and A. N. Lasenby, MNRAS **455**, 2461 (2016).
- [23] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 023 (2018).
- [24] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 022 (2018).
- [25] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 021 (2018).
- [26] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 020 (2018).
- [27] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 019 (2018).
- [28] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 018 (2018).
- [29] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 017 (2018).
- [30] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 016 (2018).
- [31] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 015 (2018).
- [32] CORE collaboration, Journal of Cosmology and Astro-Particle Physics **2018**, 014 (2018).
- [33] Planck Collaboration, A&A **617**, A48 (2018).
- [34] Planck Collaboration, ArXiv e-prints (2018), 1807.06212 .
- [35] Planck Collaboration, ArXiv e-prints (2018), 1807.06211 .
- [36] Planck Collaboration, ArXiv e-prints (2018), 1807.06210 .
- [37] Planck Collaboration, ArXiv e-prints (2018), 1807.06209 .
- [38] Planck Collaboration, ArXiv e-prints (2018), 1807.06208 .
- [39] Planck Collaboration, ArXiv e-prints (2018), 1807.06207 .
- [40] Planck Collaboration, ArXiv e-prints (2018), 1807.06206 .
- [41] Planck Collaboration, ArXiv e-prints (2018), 1807.06205 .
- [42] Planck Collaboration, ArXiv e-prints (2018), 1802.08649 .
- [43] Planck Collaboration, ArXiv e-prints (2018), 1801.04945 .
- [44] Planck Collaboration, A&A **594**, A20 (2016).
- [45] Planck Collaboration, A&A **594**, A1 (2016).