Assistant Prof. Andrew Fowlie

XJTLU, Suzhou, China

Web: https://andrewfowlie.github.io
GitHub: andrewfowlie
E-mail: Andrew.Fowlie@XJTLU.edu.cn

Born: 15 July, 1987
Nationality: British

Assistant Prof. in high-energy physics. Obtained Ph.D. in 2013. Specialize in computational methods and statistical analysis of experimental data. Published about 50 papers with over 1800 citations, including first-author papers in the most prestigious and best-ranked journals. Delivered over 50 seminars and professional presentations.

Areas of specialization

- International reputation in high-energy physics for innovative Bayesian statistical analyses, including parameter fitting, model selection and software
- Beyond the Standard Model physics, including dark matter, supersymmetry, Higgs and collider phenomenology
- Fine-tuning, naturalness and the hierarchy problem

Experience

2023 – Assistant Professor, School of Maths and Physics, XJTLU, Suzhou, China

2018 – 2022 Associate Professor, Nanjing Normal University, Nanjing, China

2015 – 2018 Post-doctoral researcher, Monash University, Melbourne, Australia
Particle phenomenology with a focus on Bayesian statistics with Prof. Csaba Balázs

2014 – 2015 Post-doctoral researcher, KBFI, Tallinn, Estonia
Particle phenomenology under Prof. Martti Raidal

2009 – 2013 Ph.D., University of Sheffield, UK
Supervised by Prof. Leszek Roszkowski

Research

Grants

More than one million RMB in funding since joining XJTLU

2024

- **560 000 RMB [PI; NSFC]** + **180 000 RMB [PI; internal]** — NSFC RFIS-II (W2432006), *Percolation of first-order cosmological phase transitions in the early Universe*, **Fowlie, A.** (PI), 1 January 2025 – 31 December 2026

- **180 000 RMB [PI; internal]** — Post-graduate Research Scholarship (PGRS FOSA2406017), *Bayes factor surface for searches for new physics*, **Fowlie, A.** (PI)

2023
- **100 000 RMB [PI; internal]** — Research Development Fund (RDF-22-02-079), *Exact-Approximate methods for searches for new physics at the Large Hadron Collider*, **Fowlie, A.** (PI), 1 July 2023 – 30 June 2025
- **550 000 RMB [CI; NSFC]** — NSFC General Program (12275134), 暗物质粒子及其相关的新物理唯象学研究, Wu, L. (PI), Fowlie, A. (CI), et al, 1 January 2023 – 31 December 2026

2020
- **$449 659 AUD [CI; ARC]** — Australian Research Council Discovery Project (DP210101636), *Electroweak phase transition: A cosmological window to new particle physics*, Kobakhidze, A. (Primary Chief Investigator), Balázs, C. (Chief Investigator), Ramsey-Musolf, M.J. (Partner Investigator), **Fowlie, A.** (Partner Investigator), 13 December 2021 – 12 December 2024

2019
- **350 000 RMB [PI; NSFC]** — NSFC RFIS-I (11950410509), *Discovering dark matter with Bayesian and frequentist statistics*, **Fowlie, A.** (PI), 1 January 2020 – 31 December 2021

Publications

- Eight articles with over 200 citations in 18 months after joining XJTLU
- *h*-index of 26, over 1,800 citations, and over 50 publications
- Published as first or corresponding author in *Nature Comm.* [97%; Q1; CS: 24.9], *Nature Reviews Methods Primers* [98%; Q1; CS: 46.1], *Rept. Prog. Phys.* [98%; Q1; CS: 31.9] and twice in *Phys. Rev. Lett.* [94%; Q1; CS: 16.5]; published in *Prog. Part. Nucl. Phys.* [99%; Q1; CS: 24.5]
- Four papers with over 100 citations & ten papers with over 50 citations
- Journal bibliometrics — percentile, quartile and Cite Score (CS) — from Scopus & corresponding author publications marked by star
- See `http://inspirehep.net/author/profile/A.Fowlie.1`

2024 ★ Q1 [1] **Fowlie, A.** & Herrera, G. Precise interpretations of traditional fine-tuning measures. Under review at *Phys. Rev. Lett.* **[94%; Q1; CS: 16.5]** (2024). [arXiv:2406.03533]

★ Q1 [2] **Fowlie, A.** The Bayes factor surface for searches for new physics. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 84**, 426, DOI: 10.1140/epjc/s10052-024-12792-9 (2024). [arXiv:2401.11710], ***4 cites***

2023 Q3 [3] Abdallah, W. *et al.* CEPC Technical Design Report: Accelerator. *Radiat. Detect. Technol. Methods* **[42%; Q3; CS: 1.5] 8**, 1–1105, DOI: 10.1007/s41605-024-00463-y (2024). [arXiv:2312.14363], ***25 cites***

★ Q1 [4] Athron, P., **Fowlie, A.**, Lu, C.-T., Morris, L., Wu, L., Wu, Y. & Xu, Z. Can Supercooled Phase Transitions Explain the Gravitational Wave Background Observed by Pulsar Timing Arrays? *Phys. Rev. Lett.* **[94%; Q1; CS: 16.5] 132**, 221001, DOI: 10.1103/physrevlett.132.221001 (2024). [arXiv:2306.17239], ***58 cites*** TOPCITE 50+

★ Q1 [5] **Fowlie, A.** & Li, Q. Modeling the R-ratio and hadronic contributions to $g-2$ with a Treed Gaussian process. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 83**, 943, DOI: 10.1140/epjc/s10052-023-12110-9 (2023). [arXiv:2306.17385], ***1 cite***

Q1 [6] Athron, P., Balázs, C., **Fowlie, A.**, Morris, L. & Wu, L. Cosmological phase transitions: From perturbative particle physics to gravitational waves. *Prog. Part. Nucl. Phys.* **[99%; Q1; CS: 24.5] 135**, 104094, DOI: 10.1016/j.ppnp.2023.104094 (2024). [arXiv:2305.02357], ***104 cites*** TOPCITE 100+

Q1 [7] Ananyev, V. *et al.* Collider constraints on electroweakinos in the presence of a light gravitino. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 83**, 493, DOI: 10.1140/epjc/s10052-023-11574-z (2023). [arXiv:2303.09082], ***16 cites***

★ Q1 [8] **Fowlie, A.** Origins of Parameters in Adimensional Models. *Int. J. Theor. Phys.* **[80%; Q1; CS: 2.5] 62**, 198, DOI: 10.1007/s10773-023-05456-z (2023). [arXiv:2302.04076]

2022 Q1 [9] Athron, P., Balázs, C., **Fowlie, A.**, Morris, L., White, G. & Zhang, Y. How arbitrary are perturbative calculations of the electroweak phase transition? *JHEP* **[94%; Q1; CS: 10] 01**, 050, DOI: 10.1007/jhep01(2023)050 (2023). [arXiv:2208.01319], ***29 cites***

★ Q1 [10] Ashton, G. *et al.* Nested sampling for physical scientists. *Nature Reviews Methods Primers* **[98%; Q1; CS: 46.1] 2**, DOI: 10.1038/s43586-022-00121-x (2022). [arXiv:2205.15570], ***50 cites*** TOPCITE 50+

★ Q1 [11] Athron, P., **Fowlie, A.**, Lu, C.-T., Wu, L., Wu, Y. & Zhu, B. Hadronic uncertainties versus new physics for the W boson mass and Muon g – 2 anomalies. *Nature Commun.* **[97%; Q1; CS: 24.9] 14**, 659, DOI: 10.1038/s41467-023-36366-7 (2023). [arXiv:2204.03996], ***108 cites*** TOPCITE 100+

Q1 [12] Athron, P., Balázs, C., **Fowlie, A.**, Lv, H., Su, W., Wu, L., Yang, J. M. & Zhang, Y. Global fits of SUSY at future Higgs factories. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 105**, 115029, DOI: 10.1103/physrevd.105.115029 (2022). [arXiv:2203.04828], ***6 cites***

2021 ★ Q2 [13] **Fowlie, A.** Neyman-Pearson lemma for Bayes factors. *Commun. In Stat. — Theory Method* **[51%; Q2; CS: 2.0]** 1–8, DOI: 10.1080/03610926.2021.2007265 (2021). [arXiv:2110.15625], ***3 cites***

★ Q1 [14] **Fowlie, A.** Comment on "Accumulating evidence for the associate production of a neutral scalar with mass around 151 GeV". *Phys. Lett. B* **[92%; Q1; CS: 9.1] 827**, 136936, DOI: 10.1016/j.physletb.2022.136936 (2022). [arXiv:2109.13426], ***6 cites***

Q1 [15] Cranmer, K. *et al.* Publishing statistical models: Getting the most out of particle physics experiments. *SciPost Phys.* **[87%; Q1; CS: 8.2] 12**, 037, DOI: 10.21468/scipostphys.12.1.037 (2022). [arXiv:2109.04981], ***38 cites***

Q1 [16] Athron, P. *et al.* Thermal WIMPs and the scale of new physics: global fits of Dirac dark matter effective field theories. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 81**, 992, DOI: 10.1140/epjc/s10052-021-09712-6 (2021). [arXiv:2106.02056], ***36 cites***

★ Q1 [17] **Fowlie, A.**, Hoof, S. & Handley, W. Nested Sampling for Frequentist Computation: Fast Estimation of Small p-Values. *Phys. Rev. Lett.* **[94%; Q1; CS: 16.5] 128**, 021801, DOI: 10.1103/physrevlett.128.021801 (2022). [arXiv:2105.13923], ***5 cites***

★ [18] **Fowlie, A.** Comment on "Reproducibility and Replication of Experimental Particle Physics Results". *Harvard Data Science Review* DOI: 10.1162/99608f92.b9bfc518 (2021). [arXiv:2105.03082]

Q1 [19] Balázs, C. *et al.* A comparison of optimisation algorithms for high-dimensional particle and astrophysics applications. *JHEP* **[94%; Q1; CS: 10] 05**, 108, DOI: 10.1007/jhep05(2021)108 (2021). [arXiv:2101.04525], ***17 cites***

2020 ★ Q2 [20] **Fowlie, A.** Objective Bayesian approach to the Jeffreys-Lindley paradox. *Commun. In Stat. — Theory Method* **[51%; Q2; CS: 2.0]** 1–6, DOI: 10.1080/03610926.2020.1866206 (2020). [arXiv:2012.04879]

★ Q1 [21] AbdusSalam, S. S. *et al.* Simple and statistically sound recommendations for analysing physical theories. *Rept. Prog. Phys.* **[98%; Q1; CS: 31.9] 85**, 052201, DOI: 10.1088/1361-6633/ac60ac (2022). [arXiv:2012.09874], ***21 cites***

★ Q1 [22] **Fowlie, A.**, Handley, W. & Su, L. Nested sampling with plateaus. *Mon. Not. Roy. Astron. Soc.* **[87%; Q1; CS: 9.1] 503**, 1199–1205, DOI: 10.1093/mnras/stab590 (2021). [arXiv:2010.13884], ***8 cites***

★ Q1 [23] Athron, P. *et al.* Global fits of axion-like particles to XENON1T and astrophysical data. *JHEP* **[94%; Q1; CS: 10] 05**, 159, DOI: 10.1007/jhep05(2021)159 (2021). [arXiv:2007.05517], ***59 cites*** TOPCITE 50+

★ Q1 [24] **Fowlie, A.**, Handley, W. & Su, L. Nested sampling cross-checks using order statistics. *Mon. Not. Roy. Astron. Soc.* **[87%; Q1; CS: 9.1] 497**, 5256–5263, DOI: 10.1093/mnras/staa2345 (2020). [arXiv:2006.03371], ***17 cites***

★ Q1 [25] Athron, P., Balázs, C., **Fowlie, A.** & Zhang, Y. PhaseTracer: tracing cosmological phases and calculating transition properties. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 80**, 567, DOI: 10.1140/epjc/s10052-020-8035-2 (2020). [arXiv:2003.02859], ***30 cites***

2019 Q1 [26] Athron, P., Balázs, C., **Fowlie, A.**, Pozzo, G., White, G. & Zhang, Y. Strong first-order phase transitions in the NMSSM — a comprehensive survey. *JHEP* **[94%; Q1; CS: 10] 11**, 151, DOI: 10.1007/jhep11(2019)151 (2019). [arXiv:1908.11847], ***44 cites***

★ Q2 [27] **Fowlie, A.** Bayesian and frequentist approaches to resonance searches. *JINST* **[59%; Q2; CS: 2.4] 14**, P10031, DOI: 10.1088/1748-0221/14/10/p10031 (2019). [arXiv:1902.03243], ***7 cites***

Q1 [28] Athron, P., Balázs, C., Bardsley, M., **Fowlie, A.**, Harries, D. & White, G. BubbleProfiler: finding the field profile and action for cosmological phase transitions. *Comput. Phys. Commun.* **[93%; Q1; CS: 12.1] 244**, 448–468, DOI: 10.1016/j.cpc.2019.05.017 (2019). [arXiv:1901.03714], ***57 cites*** TOPCITE 50+

2018 ★ Q1 [29] **Fowlie, A.** Non-parametric uncertainties in the dark matter velocity distribution. *JCAP* **[88%; Q1; CS: 10.2] 01**, 006, DOI: 10.1088/1475-7516/2019/01/006 (2019). [arXiv:1809.02323], ***11 cites***

Q1 [30] Athron, P. *et al.* Combined collider constraints on neutralinos and charginos. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 79**, 395, DOI: 10.1140/epjc/s10052-019-6837-x (2019). [arXiv:1809.02097], ***97 cites*** TOPCITE 50+

Q1 [31] Athron, P. *et al.* Global analyses of Higgs portal singlet dark matter models using GAMBIT. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 79**, 38, DOI: 10.1140/epjc/s10052-018-6513-6 (2019). [arXiv:1808.10465], ***131 cites*** TOPCITE 100+

★ Q1 [32] **Fowlie, A.** A fast C++ implementation of thermal functions. *Comput. Phys. Commun.* **[93%; Q1; CS: 12.1] 228**, 264–272, DOI: 10.1016/j.cpc.2018.02.015 (2018). [arXiv:1802.02720], ***14 cites***

2017 ★ Q1 [33] **Fowlie, A.** DAMPE squib? Significance of the 1.4 TeV DAMPE excess. *Phys. Lett. B* **[92%; Q1; CS: 9.1] 780**, 181–184, DOI: 10.1016/j.physletb.2018.03.006 (2018). [arXiv:1712.05089], ***31 cites***

Q1 [34] Athron, P., Balázs, C., **Fowlie, A.** & Zhang, Y. Model-independent analysis of the DAMPE excess. *JHEP* **[94%; Q1; CS: 10] 02**, 121, DOI: 10.1007/jhep02(2018)121 (2018). [arXiv:1711.11376],

56 cites TOPCITE 50+

★ Q1 [35] Ellis, J., **Fowlie, A.**, Marzola, L. & Raidal, M. Statistical Analyses of Higgs- and Z-Portal Dark Matter Models. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 97**, 115014, DOI: 10.1103/physrevd.97.115014 (2018). [arXiv:1711.09912], ***46 cites***

Q1 [36] Athron, P., Balázs, C., Farmer, B., **Fowlie, A.**, Harries, D. & Kim, D. Bayesian analysis and naturalness of (Next-to-)Minimal Supersymmetric Models. *JHEP* **[94%; Q1; CS: 10] 10**, 160, DOI: 10.1007/jhep10(2017)160 (2017). [arXiv:1709.07895], ***22 cites***

★ Q1 [37] **Fowlie, A.** Halo-independence with quantified maximum entropy at DAMA/LIBRA. *JCAP* **[88%; Q1; CS: 10.2] 10**, 002, DOI: 10.1088/1475-7516/2017/10/002 (2017). [arXiv:1708.00181], ***13 cites***

Q1 [38] Di Chiara, S., **Fowlie, A.**, Fraser, S., Marzo, C., Marzola, L., Raidal, M. & Spethmann, C. Minimal flavor-changing Z' models and muon $g-2$ after the R_{K^*} measurement. *Nucl. Phys. B* **[76%; Q1; CS: 5.5] 923**, 245–257, DOI: 10.1016/j.nuclphysb.2017.08.003 (2017). [arXiv:1704.06200], ***69 cites*** TOPCITE 50+

2016 Q1 [39] Balázs, C., **Fowlie, A.**, Mazumdar, A. & White, G. Gravitational waves at aLIGO and vacuum stability with a scalar singlet extension of the Standard Model. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 95**, 043505, DOI: 10.1103/physrevd.95.043505 (2017). [arXiv:1611.01617], ***57 cites*** TOPCITE 50+

★ Q1 [40] **Fowlie, A.** Bayes factor of the ATLAS diphoton excess: Using Bayes factors to understand anomalies at the LHC. *Eur. Phys. J. Plus* **[75%; Q1; CS: 5.4] 132**, 46, DOI: 10.1140/epjp/i2017-11340-1 (2017). [arXiv:1607.06608], ***5 cites***

Q2 [41] Bianchini, L., Calpas, B., Conway, J., **Fowlie, A.**, Marzola, L., Veelken, C. & Perrini, L. Reconstruction of the Higgs mass in events with Higgs bosons decaying into a pair of τ leptons using matrix element techniques. *Nucl. Instrum. Meth. A* **[56%; Q2; CS: 3.2] 862**, 54–84, DOI: 10.1016/j.nima.2017.05.001 (2017). [arXiv:1603.05910], ***36 cites***

★ Q1 [42] **Fowlie, A.** & Bardsley, M. H. Superplot: a graphical interface for plotting and analysing MultiNest output. *Eur. Phys. J. Plus* **[75%; Q1; CS: 5.4] 131**, 391, DOI: 10.1140/epjp/i2016-16391-0 (2016). [arXiv:1603.00555], ***35 cites***

★ Q1 [43] **Fowlie, A.**, Balázs, C., White, G., Marzola, L. & Raidal, M. Naturalness of the relaxion mechanism. *JHEP* **[94%; Q1; CS: 10] 08**, 100, DOI: 10.1007/jhep08(2016)100 (2016). [arXiv:1602.03889], ***29 cites***

2015 ★ Q1 [44] **Fowlie, A.** & Marzola, L. Examining a right-handed quark mixing matrix with b-tags at the LHC. *Nucl. Phys. B* **[76%; Q1; CS: 5.5] 894**, 588–601, DOI: 10.1016/j.nuclphysb.2015.03.025 (2015). [arXiv:1412.5587], ***4 cites***

2014 ★ Q1 [45] **Fowlie, A.** & Marzola, L. Testing quark mixing in minimal left–right symmetric models with b -tags at the LHC. *Nucl. Phys. B* **[76%; Q1; CS: 5.5] 889**, 36–45, DOI: 10.1016/j.nuclphysb.2014.10.009 (2014). [arXiv:1408.6699], ***15 cites***

★ Q1 [46] **Fowlie, A.** Is the CNMSSM more credible than the CMSSM? *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 74**, 3105, DOI: 10.1140/epjc/s10052-014-3105-y (2014). [arXiv:1407.7534], ***21 cites***

★ Q1 [47] **Fowlie, A.** CMSSM, naturalness and the "fine-tuning price" of the Very Large Hadron Collider. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 90**, 015010, DOI: 10.1103/physrevd.90.015010 (2014).

[arXiv:1403.3407], ***40 cites***

★ Q1 [48] **Fowlie, A.** & Raidal, M. Prospects for constrained supersymmetry at $\sqrt{s} = 33\,\text{TeV}$ and $\sqrt{s} = 100\,\text{TeV}$ proton-proton super-colliders. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1] 74**, 2948, DOI: 10.1140/epjc/s10052-014-2948-6 (2014). [arXiv:1402.5419], ***31 cites***

2013 Q1 [49] **Fowlie, A.**, Kowalska, K., Roszkowski, L., Sessolo, E. M. & Tsai, Y.-L. S. Dark matter and collider signatures of the MSSM. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 88**, 055012, DOI: 10.1103/physrevd.88.055012 (2013). [arXiv:1306.1567], ***92 cites*** TOPCITE 50+

2012 Q1 [50] **Fowlie, A.**, Kazana, M., Kowalska, K., Munir, S., Roszkowski, L., Sessolo, E. M., Trojanowski, S. & Tsai, Y.-L. S. The CMSSM Favoring New Territories: The Impact of New LHC Limits and a 125 GeV Higgs. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 86**, 075010, DOI: 10.1103/physrevd.86.075010 (2012). [arXiv:1206.0264], ***184 cites*** TOPCITE 100+

2011 Q1 [51] **Fowlie, A.**, Kalinowski, A., Kazana, M., Roszkowski, L. & Tsai, Y. L. S. Bayesian Implications of Current LHC and XENON100 Search Limits for the Constrained MSSM. *Phys. Rev. D* **[91%; Q1; CS: 8.3] 85**, 075012, DOI: 10.1103/physrevd.85.075012 (2012). [arXiv:1111.6098], ***62 cites*** TOPCITE 50+

Talks & seminars

- See all slides at `https://andrewfowlie.github.io/talk/`
- Over 50 presentations and talks; thirteen in 18 months after joining XJTLU in red

Invited

2024 [1] *Cosmological phase transitions: From perturbative particle physics to gravitational waves*, XJTLU SMP Research Excellence Workshop, 29 May

[2] *Testing fundamental theories with global fits*, Seminar, Duke Kunshan, 10 May

[3] *Testing fundamental theories with global fits*, Seminar, Suzhou Universtiy, 26 April

[4] *The Bayes factor surface for searches for new physics*, NANOGrav New Physics Working Group, 20 Febuary

2023 [5] *Origins of parameters in adimensional models*, Seminar, Fudan University, 20 October

[6] *From first order phase transitions to gravitational waves*, The 2023 Shanghai Symposium on Particle Physics and Cosmology, Tsung-Dao Lee Institute, 23 September

[7] *New physics in the garden of forking paths*, Mini-Workshop on Anomalies at the LHC, Tsung-Dao Lee Institute, 21 September

[8] *Opening up Nested Sampling*, MaxEnt 2023, 6 July

[9] *Origins of parameters in adimensional models*, Seminar, Zhejiang University, 2 June

[10] *Origins of parameters in adimensional models*, Seminar, Shandong University, 24 May

2022 [11] *Herding cats? — Bayesian and frequentist methods and compromises*, University of Goettingen CATs seminar, 14 May

2021 [12] *Nested sampling for frequentist computation: fast estimation of small p-values*, ATLAS statistics forum, 29 July

[13] *Nested sampling for frequentist computation: fast estimation of small p-values*, Purple Mountain Observatory, 9 July

[14] *Evidence for axion-like particles from XENON1T and astrophysical data*, NCBJ, Warsaw, 12 January

2020 [15] *Nested sampling cross-checks using order statistics*, Monash University, 21 July

[16] *Nested sampling cross-checks using order statistics*, Cambridge University, 15 July

2019 [17] *Strong first-order phase transitions in the NMSSM and methods for finding them*, SJTU-U. Sydney Workshop on the Electroweak Phase Transition, Tsung-Dao Lee Institute, 19 December

[18] *Bayesian and frequentist approaches to discoveries*, PASCOS, July 2

[19] *Bayesian and frequentist approaches to resonance searches*, Purple Mountain Observatory, 16 April

2018 [20] *Statistical Analyses of Higgs- and Z-Portal Dark Matter Models*, Nanjing Normal University, 25 June

[21] *Statistical Analyses of Higgs- and Z-Portal Dark Matter Models*, Melbourne University, 8 March

2017 [22] *Relative plausibility of scientific theories: WIMP dark matter*, Fundamental Physics, Symmetry and Life, University of Sydney, 30 November

[23] *Halo-independence with quantified maximum entropy*, NCTS Workshop on Dark Matter, Particles and Cosmos, Taiwan, 14 October

[24] *Halo-independence with quantified maximum entropy*, NTU, Taiwan, 12 October

[25] *Halo-independence with quantified maximum entropy*, IPMU, Tokyo, 4 October

Other talks

2024 [26] *The status of fine-tuning arguments in the CEPC era*, CEPC New Physics Workshop, 31 August

2023 [27] *Origins of parameters in adimensional models*, Colloqium, XJTLU, School of Maths and Physics, 28 September

[28] *Origins of parameters in adimensional models*, MaxEnt 2023, 7 July

2021 [29] *Nested sampling for frequentist computation: fast estimation of small p-values*, Computational Tools for High Energy Physics and Cosmology, 26 November

[30] *Getting the most out of particle physics experiments*, Workshop on Hadron Structure at High-Energy, High-Luminosity Facilities 2021, 27 October

[31] *Pitfalls in likelihood land*, (Re)interpreting the results of new physics searches at the LHC, 18 February

2020 [32] *Nested sampling cross-checks using order statistics*, First International Symposium on the Interdisciplinary Frontiers of Gravity, Matter and Quantum Information, 28 December

2019 [33] *Strong first-order phase transitions in the NMSSM and methods for finding them*, SJTU-U. Sydney Workshop on the Electroweak Phase Transition, 19 December

[34] *Combined collider constraints on neutralinos and charginos*, The tenth Weihai New Physics

Workshop, Shandong University, 14 August

[35] *Bayesian and frequentist approaches to resonance searches*, Fourteenth workshop on TeV physics, Nanjing, 21 April

[36] *Bayesian and frequentist approaches to resonance searches*, Nanjing Normal University, 17 April

2018 [37] *Non-parametric uncertainties in the dark matter velocity distribution*, Auckland University, 10 December

[38] *Statistical Analyses of Higgs- and Z-Portal Dark Matter Models*, Seoul, ICHEP 2018, 6 July

[39] *Potential applications of machine learning in particle physics*, Machine Learning Symposium, National Centre for Synchrotron Science, 19 March

2017 [40] *Using Bayes factors to understand anomalies at the LHC*, Energy Frontier in Particle Physics: LHC and Future Colliders, NTU, Taiwan, 30 September

2016 [41] *The Jeffreys-Lindley's Paradox*, CompStats Meeting, Monash University, 1 November

[42] *Bayesian approach to naturalness*, Fine-tuning, the Multiverse and Life, Sydney, 24 November

[43] *Naturalness of the relaxion mechanism*, CosPA, Sydney, 29 November

[44] *Naturalness of the relaxion mechanism*, Sheffield University

August [45] *Naturalness of the relaxion mechanism*, Nottingham University

August [46] *Bayesian naturalness of Next-to-Minimal and Minimal Supersymmetric Models*, SUSY 2016, Melbourne, 5 July

[47] *Naturalness of the relaxion mechanism*, SUSY 2016, Melbourne, 7 July

[48] *Naturalness of the relaxion mechanism*, CoEPP Annual Theory Meeting, Melbourne, 16 Febuary

2015 – 2018 [49] *Several informal seminars*, Monash University

2015 – 2016 [50] *Several informal seminars*, KBFI

2014 [51] *Prospects for constrained supersymmetry at* $\sqrt{s} = 33$ *TeV and* $\sqrt{s} = 100$ *TeV proton-proton super-colliders*, Deep Inelastic Scattering, Warsaw, 29 April

2013 [52] *Bayesian reconstruction of SUSY parameters via the golden decay*, Theory Meets Experiment, Warsaw, 6 October

[53] *Status of CMSSM after LHC Run-I*, HEP IOP, Liverpool, [54] *The CMSSM after 2 years of the LHC*, Consortium for Fundamental Physics, Sheffield, 9 April

2011 [55] *Bayesian Implications of Current LHC Limits for the Constrained MSSM*, Young Theorists' Forum, Durham, 13 December

[56] *Supersymmetry and the LHC*, Seminar, University of Sheffield, 1 October

Teaching, Lecturing & Supervision

- Preparing contribution *Explaining key concepts in physics using short videos* for the *Research-led Learning Story Collection* with Educational Developer Alan Meek

AY24 – 25
- Supervised four SURF summer project students — SURF–2024–0040 Building a Galton board
- Teaching MTH101–2324–S1 Engineering Mathematics I — 5 credits — 196 students

AY23 – 24
- Supervised four FYP students on topics in probability & statistics — MTH301–2324 Final Year Project — 5 (4.84)
- Supervised four SURF summer project students — SURF–2023–0030 Building a Lorenz wheel
- Taught PHY002–2324–S2 Physics — 5 credits — 217 students — 4.57 (4.51)
- Taught MTH101–2324–S1 Engineering Mathematics I — 5 credits — 140 students — 3.77 (4.36)
- *School Curriculum Review Board departmental representative*

AY22 – 23
- Taught PHY002–2223–S2 Physics — 5 credits — 123 students — 4.42 (4.43)

2022 – 2024
- Supervised student for three-year Master's project, Qiao Li, on measuring contributions to precision observables using Gaussian processes

2022 – 2023
- Led statistics and machine learning study group for about 10 talented undergraduates

2019 – 2022
- Post-graduate course on physics beyond the Standard Model — about 20 students and about 25 hours

2017 – 2018
- Supervised undergraduate project about the bounce equation and its connection to phase transitions and baryogenesis

2016 — 2018
- Supervised (10%) Ph.D. student, Giancarlo Pozzo, on baryogensis in next-to-minimal supersymmetric models. My role included QFT tutorials

2015 – 2016
- Supervised undergraduate Michael Bardsley's summer project. We developed statistical software resulting in a publication

2015
- Lectures on statistics for physicists at the University of Tartu — six hours and about 5 students

2012 – 2013
- First-year physics tutor, weekly tutorials — about 20 sessions with about 10 students

2010 – 2012
- Undergraduate physics weekly problem class assistant — about 30 students

Service

Departmental

2024 –
- *Departmental Events Officer*. Organizing regular seminars despite limited budget. Growing connections to other academic units. More than 10 seminars anticipated in 2024, e.g., Prof. John Dennis

2023 –
- *Departmental IT Officer*. Initiated and leading department webpage update to raise departmental profile

2019 – 2023
- Built and maintained group webpage
- Organized online seminar series, including event with Nobel Laureate with audience of over 3,500

Collaborations

2024– NANOGrav — World-leading pulsar-timing array search for gravitational waves to contribute towards data analysis

2023– Circular Electron-Positron Collider (CEPC) — A proposed next-generation world-leading experiment in fundamental science

2016– GAMBIT — International collaboration preforming statistical analyses of models of new physics

BayesFit 2011 – 2014 Bayesian analyses of supersymmetric models in light of first run of LHC, lead by Prof. Roszkowski

Editorial

Referee for physics journals: *Nature Commun.* [97%; Q1; CS: 24.9], *Phys. Rev. Lett.* [94%; Q1; CS: 16.5], *Phys. Rev. D* [91%; Q1; CS: 8.3], *Eur. Phys. J. C* [91%; Q1; CS: 8.1], *J. Phys. G* [87%; Q1; CS: 7.6], *Ann. Phys.* [68%; Q2; CS: 4.5], *Metrologia* [58%; Q2; CS: 2.8], *Nucl. Phys. B* [76%; Q1; CS: 5.5] and *Int. J. Mod. Phys. A* [51%; Q2; CS: 3.0]

Referee for statistics journal *Stat. Pap.* [67%; Q2; CS: 2.8]

Editor for *Journal of Nanjing Normal University, Physical Sciences*

University

- 2013 – Coordinate University staff social football & tennis clubs

Education and other relevant experience

2010 – 2013 Ph.D., University of Sheffield, UK
Bayesian Approach to Investigating Supersymmetric Models. Supervised by Prof. Roszkowski. Viva passed with minor corrections, examined by Prof. King (University of Southampton) and Prof. van de Bruck (University of Sheffield)

2009 – 2010 Scuola Internazionale Superiore di Studi Avanzati (Sissa), Trieste, Italy
Six-month placement studying advanced topics in particle physics and related subjects

2005 – 2009 M. Phys., University of Durham, UK
First-class four-year undergraduate Master's in Physics. Final-year modules included Advanced Theoretical Physics (82%) and Particle Theory (90%). Master's project, *The Search for Dark Matter at the Linear Collider*, supervised by Prof. Moortgat-Pick (73%)

2008 Summer placement at electricity supplier e-on about numerical simulation of atmosphere with parallel computing