Associate Prof. Andrew Fowlie

Web: https://andrewfowlie.github.io
Pure: https://scholar.xjtlu.edu.cn/en/persons/AndrewFowlie

Born: 15 July, 1987
Nationality: British

Associate Prof. in high-energy physics. Obtained Ph.D. in 2013. Specialize in computational methods and statistical analysis of experimental data. Published about 60 papers with over 2000 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

2025 – Associate Professor, School of Maths and Physics, XJTLU, Suzhou, China

2023 – 2024 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

- Fourteen articles with over 450 citations in first contract period
- *h*-index of 27, over 2,200 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]
- Six papers with over 100 citations & nine papers with over 50 citations
- Journal bibliometrics — percentile, quartile and Cite Score (CS) — from Scopus & corresponding author publications marked by star (the author lists in my fields are alphabetical)
- See `http://inspirehep.net/author/profile/A.Fowlie.1`

2025 [1] Antusch, S. *et al.* New Physics Search at the CEPC: a General Perspective (2025). [arXiv:2505.24810], ***3 cites***

★ Q1 [2] **Fowlie, A.** PolyStan: PolyChord nested sampling and Bayesian evidences for Stan models. Under review at *J. Stat. Softw.* **[98%; Q1; CS: 12.3]** (2025). [arXiv:2505.17620]

★ Q1 [3] **Fowlie, A.** stanhf: HistFactory models in the probabilistic programming language Stan. In press at *Eur. Phys. J. C* **[91%; Q1; CS: 8.1]** (2025). [arXiv:2503.22188], ***1 cite***

★ Q1 [4] Chang, C., Farmer, B., **Fowlie, A.** & Kvellestad, A. Bring the noise: exact inference from noisy simulations in collider physics. Under review at *Phys. Rev. D* **[91%; Q1; CS: 8.3]** (2025). [arXiv:2502.08157]

Q1 [5] Athron, P., Balazs, C., **Fowlie, A.**, Morris, L., Searle, W., Xiao, Y. & Zhang, Y. PhaseTracer2: from the effective potential to gravitational waves. *Eur. Phys. J. C* **[91%; Q1; CS: 8.1]** (2024). [arXiv:2412.04881], ***8 cites***

2024 Q1 [6] Albert, J., Balazs, C., **Fowlie, A.**, Handley, W., Hunt-Smith, N., de Austri, R. R. & White, M. A comparison of Bayesian sampling algorithms for high-dimensional particle physics and cosmology applications. *Comput. Phys. Commun.* **[93%; Q1; CS: 12.1]** **315**, 109756, DOI: 10.1016/j.cpc.2025.109756 (2025). [arXiv:2409.18464], ***6 cites***

★ Q1 [7] **Fowlie, A.** & Herrera, G. Precise interpretations of traditional fine-tuning measures. *Phys.*

Rev. D **[91%; Q1; CS: 8.3] 111**, 015020, DOI: 10.1103/physrevd.111.015020 (2025). [arXiv:2406.03533]

★ Q1 [8] **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], ***8 cites***

2023 Q3 [9] 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], ***129 cites*** TOPCITE 100+

★ Q1 [10] 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], ***84 cites*** TOPCITE 50+

★ Q1 [11] **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], ***2 cites***

Q1 [12] 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], ***196 cites*** TOPCITE 100+

Q1 [13] 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], ***23 cites***

★ Q1 [14] **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 [15] 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], ***46 cites***

★ Q1 [16] 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], ***175 cites*** TOPCITE 100+

★ Q1 [17] 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], ***111 cites*** TOPCITE 100+

Q1 [18] 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], ***7 cites***

2021 ★ Q2 [19] **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], ***6 cites***

★ Q1 [20] **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], ***7 cites***

Q1 [21] 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], ***48 cites***

Q1 [22] 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], ***42 cites***

★ Q1 [23] **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], ***7 cites***

★ [24] **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], ***3 cites***

Q1 [25] 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], ***27 cites***

2020 ★ Q2 [26] **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], ***1 cite***

★ Q1 [27] 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], ***27 cites***

★ Q1 [28] **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], ***10 cites***

★ Q1 [29] 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], ***64 cites*** TOPCITE 50+

★ Q1 [30] **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], ***21 cites***

★ Q1 [31] 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], ***39 cites***

2019 Q1 [32] 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], ***49 cites***

★ Q2 [33] **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], ***8 cites***

Q1 [34] 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], ***67***

cites TOPCITE 50+

2018 ★ Q1 [35] **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 [36] 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], ***107 cites*** TOPCITE 100+

Q1 [37] 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], ***141 cites*** TOPCITE 100+

★ Q1 [38] **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], ***16 cites***

2017 ★ Q1 [39] **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], ***33 cites***

Q1 [40] 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 [41] 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], ***48 cites***

Q1 [42] 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 [43] **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 [44] 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], ***70 cites*** TOPCITE 50+

2016 Q1 [45] 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], ***58 cites*** TOPCITE 50+

★ Q1 [46] **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 [47] 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], ***43 cites***

★ Q1 [48] **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], ***36 cites***

★ Q1 [49] **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], ***28 cites***

2015 ★ Q1 [50] **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 [51] **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 [52] **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 [53] **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], ***41 cites***

★ Q1 [54] **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], ***32 cites***

2013 Q1 [55] **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], ***93 cites*** TOPCITE 50+

2012 Q1 [56] **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], ***185 cites*** TOPCITE 100+

2011 Q1 [57] **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], ***63 cites*** TOPCITE 50+

Talks & seminars

- See all slides at https://andrewfowlie.github.io/talk/
- Over 50 presentations and talks

Invited

2025 [1] Are axion solutions to the CP problem fine-tuned?, The Fourth International Conference on Axion Physics and Experiment, 29 July

[2] Fitting — statistical modeling and analysis for physics, Lecture, Third New Physical Numerical Numerical Computing and Simulation Frontier Workshop, Xinxiang, 3 July

2024 [3] A cry of distress from Nature? Fine-tuning in scientific theories, XJTLU CHIPS Wisdom Forum, 9 October

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

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

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

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

2023 [8] Origins of parameters in adimensional models, Seminar, Fudan University, 20 October

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

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

[11] Opening up Nested Sampling, MaxEnt 2023, 6 July

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

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

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

2021 [15] Nested sampling for frequentist computation: fast estimation of small p-values, ATLAS statistics forum, 29 July

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

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

2020 [18] Nested sampling cross-checks using order statistics, Monash University, 21 July

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

2019 [20] 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

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

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

2018 [23] Statistical Analyses of Higgs- and Z-Portal Dark Matter Models, Nanjing Normal University, 25 June

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

2017 [25] Relative plausibility of scientific theories: WIMP dark matter, Fundamental Physics, Symmetry and Life, University of Sydney, 30 November

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

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

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

Other talks

2024 [29] The status of fine-tuning arguments in the CEPC era, CEPC New Physics Workshop, 31 August

2023 [30] Origins of parameters in adimensional models, Colloqium, XJTLU, School of Maths and Physics, 28 September

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

2021 [32] Nested sampling for frequentist computation: fast estimation of small p-values, Computational Tools for High Energy Physics and Cosmology, 26 November

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

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

2020 [35] Nested sampling cross-checks using order statistics, First International Symposium on the Interdisciplinary Frontiers of Gravity, Matter and Quantum Information, 28 December

2019 [36] Strong first-order phase transitions in the NMSSM and methods for finding them, SJTU-U. Sydney Workshop on the Electroweak Phase Transition, 19 December

[37] Combined collider constraints on neutralinos and charginos, The tenth Weihai New Physics Workshop, Shandong University, 14 August

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

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

2018 [40] Non-parametric uncertainties in the dark matter velocity distribution, Auckland University, 10 December

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

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

2017 [43] Using Bayes factors to understand anomalies at the LHC, Energy Frontier in Particle Physics: LHC and Future Colliders, NTU, Taiwan, 30 September

2016 [44] The Jeffreys-Lindley's Paradox, CompStats Meeting, Monash University, 1 November

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

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

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

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

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

2014 [50] Prospects for constrained supersymmetry at $\sqrt{s} = 33\,\text{TeV}$ and $\sqrt{s} = 100\,\text{TeV}$ proton-proton super-colliders, Deep Inelastic Scattering, Warsaw, 29 April

2013 [51] Bayesian reconstruction of SUSY parameters via the golden decay, Theory Meets Experiment, Warsaw, 6 October

[52] Status of CMSSM after LHC Run-I, HEP IOP, Liverpool, 9 April

2012 [53] The CMSSM after 2 years of the LHC, Consortium for Fundamental Physics, Sheffield, 9 April

2011 [54] Bayesian Implications of Current LHC Limits for the Constrained MSSM, Young Theorists' Forum, Durham, 13 December

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

Teaching & Supervision

Professional development

2025
- *Instructional Skills Workshop* at XJTLU, 24 hours of training

Curriculum development

2023 – 2024
- *School Curriculum Review Panel (SCRP)* representative for Department of Physics

Supervision

XJTLU postgraduate

2025 –
- Supervising MSc Data Science student, Qiao Wen
- Supervising second-year physics Phd student, Hao Yang
- Supervising incoming physics PhD student, Thato Thapo

XJTLU undergraduate

AY25 – 26
- Supervised five SURF summer project students — SURF–2025–0055 Interacting with PASCO Smart Cars using Python

AY24 – 25
- Supervised two FYP students on statistical computation — MTH301–2425 Final Year Project
- Supervised four SURF summer project students — SURF–2024–0040 Building a Galton board

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

Other

2022 – 2024
- Supervised student for three-year Master's project, Qiao Li, on measuring contributions to precision observables using Gaussian processes [2306.17385]

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 [1603.00555]

Teaching

AY24 – 25
- Taught PHY001–2525–S2 Classical Physics for Engineers — 2.5 credits — 115 students — 4.90 (4.91)
- Taught MTH101–2425–S1 Engineering Mathematics I — 5 credits — 196 students — 4.38 (4.43)

AY23 – 24
- 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)

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

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
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

Media

Articles in international news outlets, blogs and our University Marketing and Communications (UMC).

Coauthored article about *Phys. Rev. Lett.* that was syndicated in 212 non-Chinese media outlets in 7 languages with a total of about 700 000 unique readers per month. The media exposure for this alone corresponds to an advertising value equivalency of about **$1.4 million USD**. For more details see the UMC 30 day media report.

Selected internal news articles

- Dr. Andrew Fowlie joins NANOGrav
- Dr. Andrew Fowlie publishes a high-level review
- Nanohertz gravitational waves are cool but not supercool
- SMP wins 8 NSFC grants in 2024
- 28 projects approved

Selected external news articles

- Phys.org and Monash University press about *Prog. Part. Nucl. Phys.*
- Phys.org about *Phys. Rev. Lett.* paper
- Big Think about *Nature Commun.* paper
- ABC News (Norway) about *Eur. Phys. J. C* paper

Departmental

2024 – ▪ *Departmental Events Officer.* Organizing regular seminars despite limited budget – see Seminars @ Department of Physics. Growing connections to other academic units. More than 10 seminars in 2024 and 9 seminars so far in 2025, e.g., Prof. John Dennis
2023 – ▪ *Departmental IT Officer.* Initiated and leading department webpage update to raise departmental profile — see Department of Physics
2019 – 2023 ▪ Built and maintained group webpage
▪ Organized online seminar series, including event with Nobel Laureate with audience of over 3,500

Collaborations

2023 – Circular Electron-Positron Collider (CEPC) — A proposed next-generation world-leading
2016 – experiment in fundamental science Gambit — International collaboration preforming statistical analyses of models of new physics
2024 – 2025 NANOGrav — World-leading pulsar-timing array search for gravitational waves to contribute
2011 – 2013 towards data analysis BayesFit — 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

2025 ▪ Participated in Internal Peer Review for 2025 NSFC RFIS candidates, June 9
2024 ▪ Presented at Experience Sharing for Research Fund for International Scientists, 11th December
2023 ▪ Jiangsu CEAA Interviewer at XJTLU — 2 days
2023 – ▪ Coordinate University staff social football & tennis clubs

Education and other relevant experience

2009 – 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%)

2006 & 2007 Summer placement at electricity supplier e-on about numerical simulation of atmosphere with parallel computing