Assistant Prof. Andrew Fowlie

XJTLU, Suzhou, China

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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 1000 citations. About 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, 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

Publications

- *h*-index of 20, over 1,200 citations
- Published as first author in *Nature Reviews Methods Primers*, *Rept. Prog. Phys.* and *Phys. Rev. Lett.*
- See http://inspirehep.net/author/profile/A.Fowlie.1

Grants

2023 Research Development Fund, 100,000 RMB

2021 Chinese Young Scientist Grant, 400,000 RMB

2020 ARC Discovery Project (participant), 426,000 AUD

2019 Chinese Young Scientist Grant, 350,000 RMB

Talks & seminars

- See all slides at https://andrewfowlie.github.io/talk/

Invited

2023 *Opening up Nested Sampling*, MaxEnt 2023

2023 *Origins of parameters in adimensional models*, Zhejiang University

2023 *Origins of parameters in adimensional models*, Shandong University

2022 *Herding cats? — Bayesian and frequentist methods and compromises*, University of Goettingen CATs seminar

2021 *Nested sampling for frequentist computation: fast estimation of small p-values*, ATLAS statistics forum

Nested sampling for frequentist computation: fast estimation of small p-values, Purple Mountain Observatory

Evidence for axion-like particles from XENON1T and astrophysical data, NCBJ, Warsaw

2020 *Nested sampling cross-checks using order statistics*, Monash University

Nested sampling cross-checks using order statistics, Cambridge University

2019 *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

Bayesian and frequentist approaches to resonance searches, Purple Mountain Observatory

2018 *Statistical Analyses of Higgs- and Z-Portal Dark Matter Models*, Nanjing Normal University

Statistical Analyses of Higgs- and Z-Portal Dark Matter Models, Melbourne University

2017 *Fundamental Physics, Symmetry and Life*, Sydney

Halo-independence with quantified maximum entropy, NTU, Taiwan

Halo-independence with quantified maximum entropy, IPMU, Tokyo

Halo-independence with quantified maximum entropy, NCTS Workshop on Dark Matter, Particles and Cosmos, Taiwan

Other talks

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

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

Pitfalls in likelihood land, (Re)interpreting the results of new physics searches at the LHC

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

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

Combined collider constraints on neutralinos and charginos, The tenth Weihai New Physics Workshop, Shandong University

Bayesian and frequentist approaches to resonance searches, Nanjing Normal University

Bayesian and frequentist approaches to resonance searches, Fourteenth workshop on TeV physics, Nanjing

2018 *Non-parametric uncertainties in the dark matter velocity distribution*, Auckland University

Statistical Analyses of Higgs- and Z-Portal Dark Matter Models, Seoul, ICHEP 2018

Potential applications of machine learning in particle physics, Machine Learning Symposium, National Centre for Synchrotron Science

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

2016 *Naturalness of the relaxion mechanism*, Sheffield University

Naturalness of the relaxion mechanism, Nottingham University

The Jeffreys-Lindley's Paradox, CompStats Meeting, Monash University

Bayesian approach to naturalness, Fine-tuning, the Multiverse and Life, Sydney

Naturalness of the relaxion mechanism, CosPA, Sydney

Bayesian naturalness of Next-to-Minimal and Minimal Supersymmetric Models, SUSY 2016, Melbourne

Naturalness of the relaxion mechanism, SUSY 2016, Melbourne

Naturalness of the relaxion mechanism, CoEPP Annual Theory Meeting, Melbourne

2015- *Several informal seminars*, Monash University

2015-2016 *Several informal seminars*, KBFI

2014 *Prospects for constrained supersymmetry at* $\sqrt{s} = 33$ *TeV and* $\sqrt{s} = 100$ *TeV proton-proton supercolliders*, Deep Inelastic Scattering, Warsaw

2013 *Bayesian reconstruction of SUSY parameters via the golden decay*, Theory Meets Experiment, Warsaw

Status of CMSSM after LHC Run-I, HEP IOP, Liverpool

2012 *The CMSSM after 2 years of the LHC*, Consortium for Fundamental Physics, Sheffield

2011 *Bayesian Implications of Current LHC Limits for the Constrained MSSM*, Young Theorists' Forum, Durham

Supersymmetry and the LHC, Sheffield (internal)

Other skills & experience

Teaching, Lecturing & Supervision

2023 SURF summer project — "Building a Lorenz wheel"
2023 PHY002 physics module.
2022- Supervising student for three-year Master's project.
2022-2023 Leading statistics and machine learning study group for talented undergraduates.
2019-2022 Post-graduate course (about 25 hours) on physics beyond the Standard Model.
2017-2018 Supervising undergraduate project about the bounce equation and its connection to phase transitions and baryogensis.
2016-2018 Supervising (10%) Ph.D. student, Giancarlo Pozzo, on baryogensis in next-to-minimal supersymmetric models. My role includes QFT tutorials.
2015-2016 Supervised undergraduate Michael Bardsley's summer project. We developed statistical software resulting in a publication.
2015 Six hours of lectures on statistics for physicists at the University of Tartu.
2012-2013 First-year physics tutor, weekly tutorials.
2010-2012 Undergraduate physics problem class assistant.

Collaborations

2016- GAMBIT — International collaboration perofmring statistical analyses of models of new physics
2011-2013 BayesFit — Bayesian analyses of supersymmetric models in light of first run of LHC, lead by Prof. Roszkowski

Service

Referee for physics journals: *Nature Communications*, *Physical Review Letters*, *Physical Review D*, *European Physical Journal C*, *Journal of Physics G: Nuclear and Particle Physics*, *Annalen der Physik* , *Nuclear Physics B* and *International Journal of Modern Physics A*, and for statistics journals: *Statistical Papers*.
Editor for *Journal of Nanjing Normal University, Physical Sciences*.

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 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.