

ANTHONY ASHMORE

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ACADEMIC POSITIONS

Sorbonne Université , Paris, France <i>Marie Curie Global Fellow</i>	2023 to 2024
University of Chicago , Chicago, USA <i>Kadanoff Fellow</i>	2022 to 2023
University of Chicago , Chicago, USA <i>Marie Curie Global Fellow</i>	2020 to 2022
University of Pennsylvania , Philadelphia, USA <i>Postdoctoral Research Fellow</i>	2019 to 2020
University of Oxford , Oxford, UK <i>Junior Research Fellow, Merton College</i>	2016 to 2019

EDUCATION

Imperial College London , London, UK <i>PhD, Theoretical Physics</i> <ul style="list-style-type: none">• “Generalised geometry for supersymmetric flux backgrounds” with Prof. Daniel Waldram	Sep 2012 to Nov 2016
Princeton University , Princeton, New Jersey, US <i>MA, Physics</i> <ul style="list-style-type: none">• Enrolled as PhD student; studies interrupted to return to UK	Sep 2011 to Aug 2012
University of Oxford , Oxford, UK <i>MPhys (Hons), Physics, First Class</i> <ul style="list-style-type: none">• MPhys project: “Topics in gauge theories, geometry and string theory” with Prof. Yang-Hui He	Sep 2007 to June 2011

PUBLICATIONS

- [1] A. Ashmore, “Calabi-Yau metrics, CFTs and random matrices” in *Nankai Symposium on Mathematical Dialogues*(2022) . [[arXiv:2202.05896](https://arxiv.org/abs/2202.05896) [[hep-th](#)]].
- [2] “Calabi-Yau Metrics, Energy Functionals and Machine-Learning”, A. Ashmore, L. Calmon, Y.-H. He, and B. A. Ovrut [[arXiv:2112.10872](https://arxiv.org/abs/2112.10872) [[hep-th](#)]].
- [3] “Exactly Marginal Deformations and their Supergravity Duals”, A. Ashmore, M. Petrini, E. Tasker, and D. Waldram [[arXiv:2112.08375](https://arxiv.org/abs/2112.08375) [[hep-th](#)]].
- [4] “Machine Learning Line Bundle Connections”, A. Ashmore, R. Deen, Y.-H. He, and B. A. Ovrut [[arXiv:2110.12483](https://arxiv.org/abs/2110.12483) [[hep-th](#)]].
- [5] “Topological G_2 and $Spin(7)$ strings at 1-loop from double complexes”, A. Ashmore, A. Coimbra, C. Strickland-Constable, E. E. Svanes, and D. Tennyson [[arXiv:2108.09310](https://arxiv.org/abs/2108.09310) [[hep-th](#)]].
- [6] “Calabi-Yau CFTs and Random Matrices”, N. Afkhami-Jeddi, A. Ashmore, and C. Cordova, *JHEP* **02** (2022) 021, [[arXiv:2107.11461](https://arxiv.org/abs/2107.11461) [[hep-th](#)]].
- [7] “Hidden Sectors from Multiple Line Bundles for the $B - L$ MSSM”, A. Ashmore, S. Dumitru, and B. A. Ovrut [[arXiv:2106.09087](https://arxiv.org/abs/2106.09087) [[hep-th](#)]].
- [8] “Moduli-dependent KK towers and the swampland distance conjecture on the quintic Calabi-Yau manifold”, A. Ashmore and F. Ruehle, *Phys. Rev. D* **103** 10, (2021) 106028, [[arXiv:2103.07472](https://arxiv.org/abs/2103.07472) [[hep-th](#)]].

- [9] “Explicit soft supersymmetry breaking in the heterotic M-theory B – L MSSM”, A. Ashmore, S. Dumitru, and B. A. Ovrut, *JHEP* **08** (2021) 033, [[arXiv:2012.11029](#) [[hep-th](#)]].
- [10] “Eigenvalues and eigenforms on Calabi-Yau threefolds”, A. Ashmore [[arXiv:2011.13929](#) [[hep-th](#)]].
- [11] “Line Bundle Hidden Sectors for Strongly Coupled Heterotic Standard Models”, A. Ashmore, S. Dumitru, and B. A. Ovrut, *Fortsch. Phys.* **69** 7, (2021) , [[arXiv:2003.05455](#) [[hep-th](#)]].
- [12] “Heterotic backgrounds via generalised geometry: moment maps and moduli”, A. Ashmore, C. Strickland-Constable, D. Tennyson, and D. Waldram, *JHEP* **11** (2020) 071, [[arXiv:1912.09981](#) [[hep-th](#)]].
- [13] “Machine Learning Calabi–Yau Metrics”, A. Ashmore, Y.-H. He, and B. A. Ovrut, *Fortsch. Phys.* **68** 9, (2020) 2000068, [[arXiv:1910.08605](#) [[hep-th](#)]].
- [14] “Generalising G_2 geometry: involutivity, moment maps and moduli”, A. Ashmore, C. Strickland-Constable, D. Tennyson, and D. Waldram, *JHEP* **01** (2021) 158, [[arXiv:1910.04795](#) [[hep-th](#)]].
- [15] “Marginal deformations of 3d $\mathcal{N} = 2$ CFTs from AdS_4 backgrounds in generalised geometry”, A. Ashmore, *JHEP* **12** (2018) 060, [[arXiv:1809.03503](#) [[hep-th](#)]].
- [16] “Finite deformations from a heterotic superpotential: holomorphic Chern–Simons and an L_∞ algebra”, A. Ashmore, X. de la Ossa, R. Minasian, C. Strickland-Constable, and E. E. Svanes, *JHEP* **10** (2018) 179, [[arXiv:1806.08367](#) [[hep-th](#)]].
- [17] “Exactly marginal deformations from exceptional generalised geometry”, A. Ashmore, M. Gabella, M. Graña, M. Petrini, and D. Waldram, *JHEP* **01** (2017) 124, [[arXiv:1605.05730](#) [[hep-th](#)]].
- [18] “The exceptional generalised geometry of supersymmetric AdS flux backgrounds”, A. Ashmore, M. Petrini, and D. Waldram, *JHEP* **12** (2016) 146, [[arXiv:1602.02158](#) [[hep-th](#)]].
- [19] “Exceptional Calabi–Yau spaces: the geometry of $\mathcal{N} = 2$ backgrounds with flux”, A. Ashmore and D. Waldram, *Fortsch. Phys.* **65** 1, (2017) 1600109, [[arXiv:1510.00022](#) [[hep-th](#)]].
- [20] A. Ashmore and Y.-H. He, “Calabi–Yau three-folds: Poincaré polynomials and fractals” in *Strings, gauge fields, and the geometry behind: The legacy of Maximilian Kreuzer*, pp. 173–186. (2011) . [[arXiv:1110.1612](#) [[hep-th](#)]].
- [21] “Numerical analysis of space charge effects in electron bunches at laser-driven plasma accelerators”, A. Ashmore, R. Bartolini, and N. Delerue, *Central Eur. J. Phys.* **9** (2011) 980–985, [[arXiv:1008.4823](#) [[physics.acc-ph](#)]].

GRANTS AND FUNDING

Marie Curie Individual Fellowship: €260,000	2020 to 2023
<i>Global Fellowship for three-year research programme at the University of Chicago and Sorbonne Université</i>	
Grant for Short Term Scientific Mission: €1,150	Jan 2016
<i>Awarded by COST Action MP1210, for visit to LPTHE at UPMC, Paris</i>	
EPSRC Prize Studentship	2012 to 2016
<i>Awarded for PhD study, one of seven university wide</i>	

TEACHING AND MENTORING EXPERIENCE

Tutor , Merton College, Oxford	Spring 2019
<i>Third-year undergraduate tutorials on General Relativity and Cosmology</i>	
Lecturer , Mathematical Institute, Oxford	Autumn 2018
<i>Course lecturer and assessor for General Relativity I graduate course</i>	
Tutor , Merton College, Oxford	Autumn 2018

Second-year undergraduate tutorials on Mathematical Methods

College mentor, Merton College, Oxford Autumn 2017 to present

College subject mentor providing supplementary academic support to undergraduates

Class tutor, Mathematical Institute, Oxford Autumn 2017 to Summer 2018

Intercollegiate classes for General Relativity I and General Relativity II graduate courses

Tutorial assistant, Imperial College London 2012 to 2015

First- and second-year undergraduate tutorials covering classical mechanics, quantum mechanics, thermodynamics, statistical mechanics and nuclear physics

AWARDS AND PRIZES

Departmental Teaching Award, Mathematical Institute, Oxford 2019

Awarded for lecturing of General Relativity I graduate course

PROFESSIONAL ACTIVITIES AND ACADEMIC SERVICE

Seminar organiser 2021 to present

Organiser for Particle Theory Seminar series at University of Chicago

External examiner Aug 2021

External examiner for masters thesis at University of Stavanger, Norway

Outreach Oct 2020

High-school talk for Women in Math Honor Society students on string theory and uses of mathematics

Reviewer 2018 to present

Referee for Annales Henri Poincaré, Journal of Symbolic Computation, and Symmetry, Integrability and Geometry: Methods and Applications

Undergraduate interviews, Merton College, University of Oxford Dec 2018

Interviewer and assessor for undergraduate applicants in physics

Workshop organiser, South East Mathematical Physics Seminars Jul 2018

Organiser of the 12th meeting of the South East Mathematical Physics Seminar

General interest talk, Merton College, University of Oxford Jun 2018

Presentation on string theory and my work for a general audience

Oxford string theory website, University of Oxford 2018 to 2019

Web administrator for string theory group website

Library committee, Merton College, University of Oxford 2018 to 2019

Committee member on matters relating to the college library and archives, including approving annual budget and publication rights

Gardens committee, Merton College, University of Oxford 2017 to 2019

Committee member on matters relating to the maintenance and amenity of the college gardens and grounds

Outreach 2014 to present

Interviewed for podcasts discussing black holes and symmetries in nature

CONFERENCE PRESENTATIONS

“Calabi–Yau Metrics, CFTs and Random Matrices” Dec 2021

Plenary talk, string_data.2021, University of Cape Town, South Africa

“Calabi–Yau metrics: what are they good for?” Aug 2021

Plenary talk, Nankai Symposium, Nankai University, Tianjin

“Numerical metrics and the swampland distance conjecture” July 2021

Plenary talk, String Pheno 2021, Virtual

Discussion session on numerical metrics May 2021

<i>Simons Collaboration on Special Holonomy in Geometry, Analysis and Physics, Virtual</i>	
“Moduli and obstructions from a heterotic superpotential”	Sep 2018
<i>String Theory, Geometry and String Model Building, Mainz</i>	
“Moduli and obstructions of $N = 1$ heterotic backgrounds”	July 2018
<i>String Pheno 2018, Warsaw</i>	
“Generalising Calabi–Yau for generic flux backgrounds”	Feb 2017
<i>22nd European String Workshop – COST MP1210 Conference, University of Milano–Bicocca</i>	
“Marginal deformations from generalised geometry”	Feb 2017
<i>Strings, Cosmology and Gravity Student Conference, Institut Henri Poincaré</i>	
“Generalised geometry and supersymmetric flux backgrounds”	Mar 2015
<i>The Particle Physics and Cosmology of Supersymmetry and String Theory, DESY Hamburg</i>	
“Supergravity backgrounds and generalised geometry”	Nov 2014
<i>London Student Triangle, Imperial College London</i>	
“The geometry of supersymmetric AdS backgrounds”	Nov 2013
<i>Strings, Cosmology and Gravity Student Conference, Max Planck Institute for Physics, Munich</i>	

INVITED SEMINARS

“Deformed $N=1$ SCFTs and their Supergravity Duals”	April 2022
<i>String Phenomenology Seminar Series</i>	
“Exactly Marginal Deformations and their Supergravity Duals”	March 2022
<i>Joint Israeli High Energy Seminar</i>	
“Machine Learning for Calabi–Yau Compactifications”	Nov 2021
<i>Joint Edinburgh Mathematical Physics Group Seminar</i>	
“Calabi–Yau Metrics, CFTs and Random Matrices”	Oct 2021
<i>String Theory Seminar at Imperial College London</i>	
“Calabi–Yau Metrics, CFTs and Random Matrices”	Sept 2021
<i>Joint Geometry Fields and Strings Seminar at University of New England</i>	
“Calabi–Yau metrics: what are they good for?”	May 2021
<i>String Theory Seminar at University of Vienna</i>	
“Calabi–Yau metrics: what are they good for?”	May 2021
<i>High-Energy Theory Seminar at University of Liverpool</i>	
“Calabi–Yau metrics: what are they good for?”	Apr 2021
<i>String Theory Seminar at Virginia Tech</i>	
“Calabi–Yau metrics, machine learning, and the spectrum of the Laplace operator”	Feb 2021
<i>High-Energy Theory Seminar at KEK Theory Center</i>	
“Moduli of general $N = 1$ heterotic backgrounds”	Oct 2018
<i>Mathematical Physics Seminar at University of Surrey</i>	
“Moduli of general $N = 1$ heterotic backgrounds”	Apr 2018
<i>String Theory Seminar at Enrico Fermi Institute, University of Chicago</i>	
“Marginal deformations from generalised geometry”	Feb 2018
<i>Joint Edinburgh Mathematical Physics Group Seminar</i>	
“Generalising Calabi–Yau for generic flux backgrounds”	Jan 2016
<i>String Theory Seminar at Queen Mary University of London</i>	
“Generalising Calabi–Yau for generic flux backgrounds”	Nov 2015
<i>String Theory Seminar at LMU Munich</i>	
“Generalising Calabi–Yau for generic flux backgrounds”	Nov 2015

REFERENCES

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