

# ANTHONY ASHMORE

5400 S Harper Ave, Unit 1102, Chicago, 60615 IL  
+1 267 521 6396 | [ashmore@uchicago.edu](mailto:ashmore@uchicago.edu)

## ACADEMIC POSITIONS

---

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

## EDUCATION

---

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

## PUBLICATIONS

---

- [1] A. Ashmore, “Calabi-Yau metrics, CFTs and random matrices” in *Nankai Symposium on Mathematical Dialogues*. [[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  $L_\infty$  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

---

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

#### TEACHING AND MENTORING EXPERIENCE

---

<b>Tutor</b> , Merton College, Oxford	Spring 2019
<i>Third-year undergraduate tutorials on General Relativity and Cosmology</i>	
<b>Lecturer</b> , Mathematical Institute, Oxford	Autumn 2018
<i>Course lecturer and assessor for General Relativity I graduate course</i>	
<b>Tutor</b> , 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”	May 2022
<i>Exceptional Geometry Seminar Series</i>	
“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

*String Theory Seminar at LMU Munich*

“Generalising Calabi–Yau for generic flux backgrounds”

Nov 2015

*Paris String Theory Seminar at Ecole Normale Supérieure*

“Generalising Calabi–Yau for generic flux backgrounds”

Oct 2015

*String Theory Seminar at Mathematics Department, University of Oxford*

## REFERENCES

---

Daniel Waldram  
Imperial College London  
Theoretical Physics,  
Blackett Laboratory,  
London, SW7 2AZ  
[d.waldram@imperial.ac.uk](mailto:d.waldram@imperial.ac.uk)  
+44 2075 947645

Xenia de la Ossa  
University of Oxford  
Andrew Wiles Building,  
Woodstock Road,  
Oxford, OX2 6GG  
[delaossa@maths.ox.ac.uk](mailto:delaossa@maths.ox.ac.uk)  
+44 1865 615326

Burt Ovrut  
University of Pennsylvania  
209 South 33rd Street,  
Philadelphia PA, 19104  
[ovrut@elcapitan.hep.upenn.edu](mailto:ovrut@elcapitan.hep.upenn.edu)  
+1 215 898 3594

Clay Córdova  
University of Chicago  
Michelson Center for Physics,  
933 East 56th Street,  
Chicago, IL 60637  
[clayc@uchicago.edu](mailto:clayc@uchicago.edu)  
+1 773 702 4871