

Will Donovan

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Birthdate: 6th June 1982
Nationality: UK



Academic positions

2021– Yau MSC, Tsinghua University: Associate Professor
2018–21 Yau MSC, Tsinghua University: Assistant Professor
2014–18 Kavli IPMU, University of Tokyo: Postdoctoral Fellow
2011–14 University of Edinburgh: Research Assistant

Further affiliation

2021– Yanqi Lake BIMSA: Adjunct Associate Professor
2020– Kavli IPMU, University of Tokyo: Visiting Scientist

Education

2007–11 PhD Mathematics, Imperial College London (with R.P. Thomas, E. Segal)
2003–4 MMath Mathematics, University of Cambridge (Part III)
2000–3 BA Mathematics, University of Cambridge

Publications

1. Grassmannian twists on the derived category via spherical functors
Proc. London Math. Soc. (2013) 107 (5): 1053–1090.
2. Window shifts, flop equivalences and Grassmannian twists (with E. Segal)
Compositio Math. (2014) 150 (6): 942–978. (with E. Segal)
3. Mixed braid group actions from deformations of surface singularities (with E. Segal)
Comm. Math. Phys. (2015) 335 (1): 497–543.
4. The Pfaffian-Grassmannian equivalence revisited (with N. Addington and E. Segal)
Alg. Geom., Foundation Compositio Math. (2015) 2 (3): 332–364.
5. Noncommutative deformations and flops (with M. Wemyss)
Duke Math. Jour. (2016) 165 (8): 1397–1474.
6. Moduli spaces of torsion sheaves on K3 surfaces (with N. Addington and C. Meachan)
J. London Math. Soc. (2016) 93 (3): 846–865.
7. Mukai flops and \mathbb{P} -twists (with N. Addington and C. Meachan)
J. Reine Angew. Math. (Crelle) (2019) 748: 227–240.
8. Contractions and deformations (with M. Wemyss)
Amer. J. Math. (2019) 141 (3): 563–592.

9. Twists and braids for general 3-fold flops (with M. Wemyss)
J. Eur. Math. Soc. (2019) 21 (6): 1641–1701.
10. Perverse schobers and wall crossing
Int. Math. Res. Notices (2019) 18: 5777–5810.
11. Noncommutative enhancements of contractions (with M. Wemyss)
Adv. Math. (2019) 344: 99–136.
12. Perverse schobers on Riemann surfaces: constructions and examples
Eur. J. Math. (2019) 5: 771–797.
13. Mirror symmetry for perverse schobers from birational geometry (with T. Kuwagaki 桑垣樹)
Comm. Math. Phys. (2021) 381: 453–490.
14. Stringy Kähler moduli for the Pfaffian-Grassmannian correspondence
SIGMA (2021) 17, 028.
15. Relating derived equivalences for simplices of higher-dimensional flops
Adv. Stud. Pure Math. (2023) 88: 305–330.
16. Root stacks and periodic decompositions (with A. Bodzenta)
Manuscripta Math. (2024) 175: 53–73.
17. Stringy Kähler moduli, mutation and monodromy (with M. Wemyss)
J. Diff. Geom. (2025) 129 (1): 115–164.
18. Derived symmetries for crepant contractions to hypersurfaces
Preprint, arXiv:2409.19555.
19. Window categories for a simple 9-fold flop of Grassmannian type
(with W. Hara, M. Kapustka, M. Rampazzo)
Preprint, arXiv:2510.06184.
20. Quiver braid group action for a 3-fold crepant resolution (with Luyu Zheng 郑璐予)
Preprint, arXiv:2512.19140.
21. Higher-dimensional conifolds and hypergeometric systems (with Weilin Su 苏蔚琳)
In preparation.

Proceedings

22. Grassmannian twists, derived equivalences and brane transport
Proc. Symp. Pure Math. (2015), Proc. String-Math 2012.
23. Contractions of 3-folds: deformations and invariants
Internat. J. Math. (2016) 27 (7), special issue VBAC 2014.
24. Applications of noncommutative deformations
Proc. Kinoshita Alg. Geom. Symp. (2016), available online.

Grants

- 2019– China central government **Thousand Talents Plan**
Value: 2.5 million yuan (~\$350k)
- 2016–18 Japan Soc. for Promotion of Science KAKENHI **Young Scientist B**
Value: 2.9 million yen (~\$25k)

Awards

- 2020 Yau MSC Ruolin 若琳 Research Excellence Award
2019 Yau MSC Outstanding Paper Award 'Twists and braids for general 3-fold flops'

Doctoral students

- 2019–23 **Xun Lin** 林汛 derived categories, birational geometry, Hodge theory
'Non-commutative aspects of Hodge conjecture, minimality, and Torelli problems'
Postdoctoral fellow, MPIM Bonn (2023–25)
Postdoctoral fellow, HKUST, Hong Kong (2025–26)
Assistant professor, CUHK Shenzhen (2026–)
- 2020–25 **Luyu Zheng** 郑璐予 toric geometry, braid groups, perverse sheaves
'Braid groups associated with exceptional surfaces in 3-folds'
- 2021– **Nantao Zhang** 张南涛 Bridgeland stability, birational and enumerative geometry
'Stability conditions on local Calabi–Yau fourfolds and on blowups'

Masters students

- 2019–25 **Weilin Su** 苏蔚琳 categorification, hypergeometric systems, mirror symmetry
'Derived monodromy for the Appell F_4 hypergeometric system'

Mentoring

Junior faculty

- 2023–25 **Beihui Yuan** 袁北翥 commutative algebra, Calabi–Yau geometry, algebraic splines

Postdocs

- 2023–24 **Qingjing Chen** 陈晴靖 derived categories, Fano varieties, Bridgeland stability
2024– **Alicia Lamarche** derived categories, toric geometry, rationality
2024– **Aimeric Malter** mirror symmetry, toric geometry, categorical resolutions

Teaching

Yau MSC, Tsinghua University

- 2025 Topics in complex algebraic geometry
2025 Topics in algebraic geometry (homological mirror symmetry)
2024 Theoretical mechanics
2023 Topics in algebraic geometry (derived categories and toric geometry)
2023 Calculus 2
2022 Theoretical mechanics
2022 Lie groups and Lie algebras
2021 Geometric representation theory 2 (with Penghui Li 李鹏辉)
2021 Derived functors in algebraic and birational geometry
2020 Calculus 1
2020 Mirror symmetry: categories and constructions
2019 Geometric representation theory 2 (with Peng Shan 单芑)
2019 Calculus 2
2018 Derived functors in algebraic and birational geometry

- 2023 Introduction to topos quantum theory
- 2022 Quiver approaches to machine learning
- 2022 Categorical and geometric aspects of quantum mechanics

Extended visits

- Apr–May 2024 Sydney Mathematical Research Institute
- Mar 2024 IMS, Chinese University of Hong Kong
- Jun–Jul 2020 Korean Institute of Advanced Study, Seoul
- Feb–Jun 2020 Kavli IPMU, University of Tokyo
- Jan–Apr 2014 Hausdorff Institute, Bonn
- Apr–Jul 2013 Schrödinger Institute, Vienna

Selected talks

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|--|---|---|
| 2025
Cetraro, Italy
Wuhan U, China | 2019 (continued)
BIRS Oaxaca, Mexico
CTU, Prague
Fudan U, Shanghai
Kyoto U
Liverpool U
Osaka U
Sydney U
SYSU, Guangzhou | 2015
Nayoga U
Fields Institute, Toronto
Max Planck Inst, Bonn
Oberwolfach
Warwick U |
| 2024
Fujiyoshida, Japan
Makerere U, Uganda
UBC, Vancouver
TSIMF Sanya, Hainan | | 2014
Freie Universität, Berlin
BICMR, Beijing
Hamburg U
KIAS, Seoul
Sheffield U |
| 2023
IMPAN, Warsaw
Kavli IPMU, Tokyo
Krakow, Poland
Max Planck Inst, Bonn | 2018
Hokkaido U
Nayoga U
TSIMF Sanya, Hainan | 2013
Cardiff U
Columbia U
Duke U
Edinburgh U
Imperial College London
Leeds U
Oxford U
Schrödinger Inst, Vienna |
| 2022
Cambridge U
Oberwolfach
UCL, London | 2017
Australian National U
Bath U
ICMS, Edinburgh U
Nayoga U
Osaka U
SISSA, Trieste | |
| 2021
BICMR, Peking U
Cardiff U
CMSA, Harvard U | 2016
BIRS Banff
ECM, Berlin
Freie Universität, Berlin
Hanga Roa, Chile
Hong Kong U
Kinosaki Symposium
Kyoto U
METU, Ankara | 2012
ETH Zürich
Glasgow U
Hausdorff Institute, Bonn
Newcastle U
Steklov Inst, Moscow
Queen Mary, U London
Warwick U |
| 2020
IASM, Hangzhou
KAIST, Korea
KIAS, Seoul
Steklov Inst, Moscow | | |
| 2019
Auckland U, New Zealand
Australian National U | | |

Service

Conference organization

- Workshop 'Homological algebra of the infrared' at TSIMF, Sanya, organizer (2023)
~20 speakers, including A. Bondal, M. Kapranov, Fields medallist M. Kontsevich
- Workshop 'Categorified wall crossing' at U California, Davis, mentor (2021)
- Workshop 'Derived categories' at Hausdorff Institute, Bonn, organizer (2014)

Yau MSC, Tsinghua

- Foreign affairs committee (2023–)
- Tutor, Qiuzhen college (2023–)
- Events Hub organizer (2021–)
- Geometric representation theory seminar organizer (2021–)
- Colloquium committee (2019–21)

Outreach

- Workshop series, for University of Tokyo 'Soap bubbles and spacetime' (2017–)
At 6 locations, including Tamarokuto Science Centre and Kavli IPMU
- Interviewed, for University of Tokyo 'Discover Our People' (2016)
- Talk: 'The frontiers of symmetry: hidden geometry and tangled superstrings'
King's College London Math School (2015)
- Summerhall, Edinburgh, for International Year of Crystallography (2014)

Previous employment

- 2006–7 Lead programmer, Bloomberg LP: financial research and development
- 2005 TEFL teacher, Kyoto, Japan

Languages

- English (native)
- Japanese, Mandarin (advanced)