

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 Associate Scientist

Education

2007–11 PhD Mathematics, Imperial College London
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.
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. Stringy Kähler moduli, mutation and monodromy (with M. Wemyss)
To appear **J. Diff. Geom.**, arXiv:1907.10891.
16. Relating derived equivalences for simplices of higher-dimensional flops
Adv. Stud. Pure Math. (2023) 88: 305–330.
17. Root stacks and periodic decompositions (with A. Bodzenta)
Preprint, arXiv:2307.09888.

Proceedings

18. Grassmannian twists, derived equivalences and brane transport
Proc. Symp. Pure Math. (2015), Proc. String-Math 2012.
19. Contractions of 3-folds: deformations and invariants
Internat. J. Math. (2016) 27 (7), special issue VBAC 2014.
20. Applications of noncommutative deformations
Proc. Kinosaki 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’

Visits

Jun–Aug 2022 University College London, UK
Aug–Sep 2020 University of Glasgow, UK
Jun–Jul 2020 Korean Institute of Advanced Study, Seoul
Feb–Jun 2020 Kavli IPMU, University of Tokyo
Jul–Aug 2014 Korean Institute of Advanced Study, Seoul
Jan–Apr 2014 Hausdorff Institute, Bonn
Apr–Jul 2013 Schrödinger Institute, Vienna
May 2012 Steklov Institute, Moscow

Postdoctoral mentoring

2023– **Yuxiang Liu** Schubert varieties, invariants and deformations
2023– **Qingjing Chen** 陈晴靖 derived categories, Fano varieties, Bridgeland stability
2023– **Beihui Yuan** 袁北誓 commutative algebra, Calabi–Yau geometry, algebraic splines

Postgraduate students

2019–23 **Xun Lin** 林汛 derived categories, birational geometry, Hodge theory
Postdoctoral fellow, MPIM Bonn (2023–)
2019– **Weilin Su** 苏蔚琳 categorification, hypergeometric systems, mirror symmetry
2020– **Luyu Zheng** 郑璐予 toric geometry, braid groups, perverse sheaves
2021– **Nantao Zhang** 张南涛 enumerative geometry, derived geometry

Teaching

Yau MSC, Tsinghua University

2023 Topics in algebraic 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 单芃)
2019 Calculus 2
2018 Derived functors in algebraic and birational geometry

Yanqi Lake BIMSA

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

Yau Tsinghua Mathcamp

2021 From classical to quantum mechanics (with Mauricio Romo)

Selected talks

2023

IMPAN, Warsaw
Kavli IPMU, Tokyo
Krakow, Poland
Max Planck Inst, Bonn

2022

Cambridge U
Oberwolfach
Sydney U
UCL, London

2021

BICMR, Peking U
Cardiff U
CMSA, Harvard U

2020

CNU, Beijing
IASM, Hangzhou
Kavli IPMU, Tokyo
KAIST, Korea
KIAS, Seoul
Steklov Inst, Moscow
Warwick U

2019

Auckland U, New Zealand
Australian National U
BIRS Oaxaca, Mexico
CTU, Prague
Fudan U
Kyoto U
Liverpool U
Osaka U

2019 (continued)

Sydney U
SYSU, Guangzhou

2018

Hokkaido U
Nayoga U
TSIMF Sanya, Hainan
Yau MSC Tsinghua, Beijing

2017

Australian National U
Bath U
ICMS, Edinburgh U
Nayoga U
Osaka U
SISSA, Trieste

2016

BIRS Banff
ECM, Berlin
Freie Universität, Berlin
Hanga Roa, Chile
Hong Kong U
Kinosaki Symposium
Kyoto U
METU, Ankara
Nayoga U
Tokyo U

2015

Fields Institute, Toronto
Kent U
Max Planck Inst, Bonn

2015 (continued)

Oberwolfach
Warwick U

2014

Freie Universität, Berlin
BICMR, Beijing
Hamburg U
Kavli IPMU, Tokyo
KIAS, Seoul
Sheffield U

2013

Cardiff U
Columbia U
Duke U
Edinburgh U
Imperial College London
Leeds U
Oxford U
Schrödinger Inst, Vienna

2012

ETH Zürich
Glasgow U
Hausdorff Institute, Bonn
Newcastle U
Steklov Inst, Moscow
Queen Mary, U London
Warwick U

2011

Edinburgh U
Warwick U

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)

Service

Conference organization

Workshop 'Homological algebra of the infrared' at TSIME, Sanya, organizer (2023)

~20 international speakers, including Fields Medallist Maxim Kontsevich

Workshop 'Categorified wall crossing' at U California, Davis, mentor (2021)

Workshop 'Derived categories' at Hausdorff Institute, Bonn, organizer (2014)

Yau MSC, Tsinghua

Tenure-track recruitment committee (2023–)

Geometric representation theory seminar organizer (2021–)

Colloquium committee (2019–21)

Previous employment

2006–7 Lead programmer, Bloomberg LP: financial research and development

2005 TEFL teacher, Kyoto, Japan

Languages

– English (native)

– Japanese, Mandarin (advanced)