Daniel Platt

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Education

2017–2022 Ph.D., Mathematics, Imperial College London
2014–2017 MSc, Mathematics, Humboldt University Berlin
2011–2015 BSc, Mathematics, Humboldt University Berlin

Work Experience

2023–2025 Chapman-Schmidt Fellow, Imperial College London
2021–2023 Research Associate, King's College London

Publications

Journal Articles

1. Festi, D., Nijgh, W. & Platt, D. K3 surfaces with two involutions and low Picard number. *Geom. Dedicata* **218,** Paper No. 55, 28. ISSN: 0046-5755,1572-9168. https://doi.org/10.1007/s10711-024-00900-8 (2024).
2. Platt, D. G_2-instantons on Resolutions of G_2-orbifolds. *Communications in Mathematical Physics* **405,** 81. ISSN: 1432-0916. https://doi.org/10.1007/s00220-024-04947-2 (Mar. 2024).
3. Dwivedi, S., Platt, D. & Walpuski, T. Associative submanifolds in Joyce's generalised Kummer constructions. *Comm. Math. Phys.* **401,** 2327–2353. ISSN: 0010-3616,1432-0916. https://doi.org/10.1007/s00220-023-04716-7 (2023).

Peer-reviewed Conference Proceedings

4. Aslan, B., Platt, D. & Sheard, D. *Group invariant machine learning by fundamental domain projections* in *NeurIPS Workshop on Symmetry and Geometry in Neural Representations* (2023), 181–218.

Preprints

5. Albertini, E., Platt, D. & Wiseman, T. *Towards a uniqueness theorem for static black holes in Kaluza-Klein theory with small circle size* 2024. arXiv: 2410.20967 [hep-th]. https://arxiv.org/abs/2410.20967.
6. Douglas, M. R., Platt, D. & Qi, Y. *Harmonic 1-forms on real loci of Calabi-Yau manifolds* 2024. arXiv: 2405.19402 [math.DG]. https://arxiv.org/abs/2405.19402.
7. Galdeano, M., Platt, D., Tanaka, Y. & Wang, L. *Spin(7)-instantons on Joyce's first examples of compact Spin(7)-manifolds* 2023. arXiv: 2310.03451 [math.DG]. https://arxiv.org/abs/2310.03451.

8. Platt, D. *Improved Estimates for G_2-structures on the Generalised Kummer Construction* 2022. arXiv: 2011.00482 [math.DG]. https://arxiv.org/abs/2011.00482.

Publications and preprints where I am not a first author

9. Ewert, C., Magruder, S., Maiboroda, V., Shen, Y., Singh, P. & Platt, D. *Group-invariant machine learning on the Kreuzer-Skarke dataset* 2024. https://doi.org/10.1016/j.physletb.2024.138996.
10. Vom Berg, G. L. W., Röhr, V., Platt, D. & Blankertz, B. *A New Canonical Log-Euclidean Kernel for Symmetric Positive Definite Matrices for EEG Analysis (Oct 2024)* 2024. 10.1109/TBME.2024.3483936.

Invited Talks

1. *Solving PDEs with Newton's method.* Chinese University of Hong Kong, Shenzhen. Dec. 2024.
2. *An introduction to group invariant machine learning.* I-X, Imperial College London. Nov. 2024.
3. *Machine learning for differential geometry.* I-X, Imperial College London. Nov. 2024.
4. *New examples of G_2-instantons.* Mathematics Inspired by String Theory workshop, Chinese University of Hong Kong. Oct. 2024.
5. *Numerical approximations of harmonic 1-forms on real loci of Calabi-Yau manifolds.* Mathematics Inspired by String Theory workshop, Chinese University of Hong Kong. Oct. 2024.
6. *Numerical approximations of harmonic 1-forms on real loci of Calabi-Yau manifolds.* Humboldt University Berlin Gauge Theory Research Seminar. July 2024.
7. *New Spin(7)-instantons on compact manifolds.* Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics (Durham, North Carolina). May 2024.
8. *New Spin(7)-instantons on compact manifolds.* Special Riemannian geometries in dimensions 6,7,8 (Université de Montréal). Apr. 2024.
9. *Numerical approximations of harmonic 1-forms on real loci of Calabi-Yau manifolds.* Loughborough University Geometry Seminar. Mar. 2024.
10. *Group invariant machine learning on pure maths datasets.* University of Hong Kong Geometry Seminar. Feb. 2024.
11. *New examples of Spin(7)-instantons on compact manifolds.* University of Leeds Geometry Seminar. Nov. 2023.
12. *Numerically verified proofs.* Faculty of Natural Sciences Postdoc Showcase, Imperial College London. Nov. 2023.
13. *G_2-instantons on resolutions of G_2-orbifolds.* University of Kyoto Geometry and Topology Seminar. Oct. 2023.
14. *K3 surfaces with two involutions and low Picard number.* University of Kyoto Algebraic Geometry Seminar. Oct. 2023.
15. *G_2-instantons on the Generalised Kummer Construction.* Rutgers University Gauge Theory Seminar. Sept. 2023.

16. *Approximations of harmonic 1-forms on real loci of Calabi-Yau 3-folds.* Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics: Progress and Open Problems (Stony Brook University, New York). Sept. 2023.
17. *K3 surfaces with low Picard number.* Workshop BRIDGES: Specials geometries and gauge theories (Pau, France). June 2023.
18. *K3 surfaces with low Picard number.* Geometry Seminar at Universita degli studi di Milano. June 2023.
19. *An example of a G_2-instanton on a resolution of $(K3 \times T^3)/\mathbb{Z}_2^2$ coming from a stable bundle.* Spinorial and Octonionic Aspects of G2 and Spin(7) Geometry (Banff Research Station). May 2023.
20. *An explicit example of a G_2-instanton on a resolution of $(K3 \times T^3)/\mathbb{Z}_2^2$ coming from a stable bundle.* Gauge Seminar at Humboldt University Berlin. May 2023.
21. *Group invariant machine learning by fundamental domain projections.* University of Nottingham Online Machine Learning Seminar. May 2023.
22. *K3 surfaces with low Picard number.* Geometry Seminar at Humboldt University Berlin. May 2023.
23. *Perturbing an approximate solution to a PDE in geometry obtained with computer aid.* King's College London Analysis Seminar. Apr. 2023.
24. *A Numerically Verifiable Proof for M-theory Compactifications (Poster).* Kings and Queens of Gravity. Mar. 2023.
25. *An application of numerical techniques to rigorous proof in special holonomy.* Computational Differential Geometry and its Applications in Physics, Simons Center for Geometry and Physics. Nov. 2022.
26. *Associatives in the generalised Kummer construction.* University of Waterloo Geometry Seminar. Oct. 2022.
27. *Associatives in the generalised Kummer construction.* Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics: Progress and Open Problems 2022 (Stony Brook University, New York). Sept. 2022.
28. *G_2-instantons.* Geometric Analysis: Past, Present and Future 5 (online). Apr. 2022.
29. *Associatives in the generalised Kummer construction.* King's College London Geometry Seminar. Apr. 2022.
30. *An example of a G_2-instanton over $(K3 \times T^3)/\mathbb{Z}_2^2$.* Junior Special Geometers Meeting (King's College London). Jan. 2022.
31. *G_2-instantons on resolutions of G_2-orbifolds.* Louisiana State University Geometry Seminar. Nov. 2021.
32. *New estimates for G_2-structures on resolutions of orbifolds.* Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics: Progress and Open Problems 2021 (Stony Brook University, New York). Sept. 2021.
33. *Gluing Constructions in Gauge Theory.* Oxford-London Gauge Assembly (online). June 2021.
34. *Convolutions on manifolds and applications to geometric deep learning.* King's College London/University College London Junior Geometry Seminar. May 2021.

35. *Elliptic Operators on Non-Compact Manifolds.* Imperial College London Junior Geometry Seminar. Mar. 2021.
36. *Group Invariant Machine Learning through Near-Isometries (Poster).* Imperial College Data Science Virtual Poster Competition. Dec. 2020.
37. *Gluing of ASD-instantons.* Brussels-London Geometry Research Network Lecture Series on Gauge Theory (online). Nov. 2020.
38. *G_2-instantons and Joyce-Karigiannis manifolds.* LMBA workshop "Special Geometries and Gauge Theory" (online). June 2020.
39. *G_2-instantons and Joyce-Karigiannis manifolds.* CMO BIRS workshop "G2 Geometry and Related Topics" (Oaxaca). June 2020.
40. *Introduction to gauge theory.* Imperial College Junior Geometry Seminar. Dec. 2018.
41. *Cohomogeneity one actions on symmetric spaces.* King's College London/University College London Junior Geometry Seminar. May 2018.
42. *The Tractor construction, conformal geodesics, and applications to conformal compactifications.* Potsdam University Geometry Seminar. Feb. 2017.

Teaching

Spring 2025	Lecturer, Complex Manifolds, Imperial College London
Spring 2024	Tutor, Year 1 tutorial, Imperial College London
Fall 2023/24	Tutor, Year 1 tutorial, Imperial College London
Spring 2021	Tutor, Pure Mathematics, University College London
Fall 2020/21	Tutor, Pure Mathematics, University College London
Spring 2020	Tutor, Advanced Machine Learning, Imperial College London
Fall 2019/20	Tutor, Machine Learning, Imperial College London
Spring 2019	Tutor, Pure Mathematics, University College London
Fall 2018/19	Tutor, Lie Groups and Lie Algebras, King's College London
Fall 2018/19	Tutor, Pure Mathematics, University College London
Fall 2017/18	Grader, Topology I, Humboldt University Berlin
Spring 2017	Grader, Algebra and Number Theory, Humboldt University Berlin
Fall 2016/17	Grader, Elementary Geometry, Humboldt University Berlin
Spring 2016	Grader, Linear Algebra, Humboldt University Berlin
Spring 2015	Tutor, Mathematics for Chemists II, Technical University Berlin
Fall 2014/15	Tutor, Mathematics for Chemists I, Technical University Berlin
Spring 2014	Tutor, Mathematics for Chemists II, Technical University Berlin

Awards & Honors

2024	Workshop funding for London Geometry and Machine Learning Summer School. Heilbronn Institute for Mathematical Research (£5000), Schmidt Sciences (30500 USD), London School of Number Theory and Geometry (£2000), Deepmind (£2000), G-Research (£4000), International Journal for Artificial Intelligence (£850), Roche (£2000), Epic Games (£2000).

2023 Postdoctoral fellowship. Schmidt Sciences (£195000).

2023 Workshop funding for British Isles Graduate Workshop IV. Foundation Compositio (2000 EUR), London Mathematical Society (£2500), London School of Number Theory and Geometry (£4000), Simons Foundation (£3000).

2022 Early Career Fellowship. London Mathematical Society (£4200).

2021 Workshop funding for London Geometry and Machine Learning Summer School. Arabesque AI (£1000), Autodesk (£1000), Bosch (£1000), EigenTechnologies (£1000), Gather (£800), Google (£1000), Foundation Compositio Mathematica (2000 EUR), Institute of mathematics and its applications (£1200), London School of Number Theory and Geometry (£3000), Relation Therapeutics (£1000), Speechmatics (£1000), XTX Markets (£1000).

2019 Workshop funding for British Isles Graduate Workshop III. Heilbronn Institute for Mathematical Research (£3000), London School of Number Theory and Geometry (£5000), Simons Foundation (£3000), University College London (£500).

2017 PhD maintenance and fees scholarship. London School of Number Theory and Geometry.

2014 Undergraduate scholarship. German National Academic Foundation (62500 EUR).

Academic Advising

Individual

2024-2025 Frank She. Imperial College London, MSc project

Group

2024 Nathan Burn, Arham Deep, Ishaan Sing, David Wu, Zihan Zhang. Imperial College London second year undergraduate project

2022 Christian Ewert, Sumner Magruder, Vera Maiboroda, Yueyang Shen, Pragya Singh. Summer school project for *London Geometry and Machine Learning*, results published in Physics Letters B

Service

Conference organisation

2024 London Geometry and Machine Learning Workshop. Summer school featuring small group mentored projects

2023 British Isles Graduate Workshop: Geometric flows and related topics. Summer school for PhD students

2022-2023 KCL Geometry Seminar. Weekly seminar

2022 Junior Special Geometers Meeting. 3-day conference on special geometries

2021 London Geometry and Machine Learning Workshop. Summer school featuring small group mentored projects

2020	Lecture Series on Gauge Theory with support from the London Mathematical Society. Series of five online lectures by PhD students for beginning PhD students
2020	Geometry and Machine Learning with Applications to Biomedical Engineering. Workshop for PhD students with tutorials and research talks
2020	Oxford-London Gauge Assembly. Workshop for PhD students
2019	British Isles Graduate Workshop "Gauge Theory with a View to Higher Dimensions". Summer school for PhD students
2018–2020	KCL/UCL Junior Geometry Seminar. Weekly seminar

Editor

Since 2022	International Journal of Data Science in the Mathematical Sciences

Reviewer

2024	Empirical Methods in Natural Language Processing
2022-2024	Conference on Neural Information Processing Systems (reviewer for workshop "Neurreps")
2022	Annual Meeting of the Association for Computational Linguistics

Committees

2024	Research Space Committee, Imperial College London
2022-2023	Research Staff Committee, King's College London

Outreach

2024	London Maths Outreach, Volunteer Manager.
2018-2020	London Maths Outreach, Founder. Directing 25 volunteers to deliver weekly maths sessions.
2018-2019	Royal Institution Masterclass, Speaker. Deliver 3-hour long interactive classes for groups of 50-70 students.
2018-2019	The Brilliant Club Tutor. Deliver 6-week long classes for students in small groups.
2016-2017	Kiron Higher Education for Refugees, Curriculum Design Volunteer. Course design for Computer Science online study programme.
2011-2017	Mathematical Students Association Berlin, Teacher. Teaching weekly maths outreach sessions.

Other Experience

2020	12-weeks AI Research Intern (Arabesque AI)
2012-2014	Chess Club Chairmain (Chess Club Tempelhof)
2010-2011	Civil Service (Zukunft Bauen e.V.)

Last updated: December 30, 2024