

TIMOTHY MAGEE

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Department of Mathematics
King's College London
United Kingdom

Postdoctoral Research Positions:

*2020 - present*¹ King's College London
Feb - Aug 2021: Imperial College London
2018 - 2020: University of Birmingham
2017 - 2018: Instituto de Matemáticas de la UNAM Unidad Oaxaca

Graduate Education:

2012 - 2017: University of Texas at Austin, Ph.D. in Mathematics
 Advisor: Sean Keel
2010 - 2012: University of Texas at Austin, Physics
 Transferred to Mathematics

Research Interests:

Mirror symmetry, cluster varieties, toric varieties, convex geometry, and combinatorial representation theory. Specifically, I study mirror symmetry for cluster varieties and generalizations of toric geometry to the cluster world. This involves a generalization of convex geometry to piecewise-linear (tropical) spaces and its algebro-geometric interpretations. There are many applications in combinatorial representation theory.

Articles:

- Newton–Okounkov bodies and minimal models for cluster varieties*
Joint with L. Bossinger, M.-W. Cheung, and A. Nájera Chávez
[arXiv:2305.04903](https://arxiv.org/abs/2305.04903) [math.AG]
- Quantization of deformed cluster Poisson varieties*
Joint with M.-W. Cheung and J. B. Frías-Medina
[arXiv:2007.02479](https://arxiv.org/abs/2007.02479) [math.QA] Journal: Algebras and Representation Theory
- Compactifications of cluster varieties and convexity*
Joint with M.-W. Cheung and Nájera Chávez
[arXiv:1912.13052](https://arxiv.org/abs/1912.13052) [math.AG] Journal: International Mathematics Research Notices
- Toric degenerations of cluster varieties and cluster duality*
Joint with L. Bossinger, J. B. Frías Medina, and A. Nájera Chávez
[arXiv:1809.08369](https://arxiv.org/abs/1809.08369) [math.AG] Journal: Compositio Mathematica
- Littlewood–Richardson coefficients via mirror symmetry for cluster varieties*
[arXiv:1709.05776](https://arxiv.org/abs/1709.05776) [math.AG] Journal: Proceedings of the London Mathematical Society
- Fock–Goncharov conjecture and polyhedral cones for $U \subset SL_n$ and base affine space SL_n/U*
[arXiv:1502.03769](https://arxiv.org/abs/1502.03769) [math.AG]

¹Excluding 7 months at Imperial College London

Teaching:

Lectures

- Spring 2023* Toric Varieties
Designed and taught grad course on toric varieties. Notes available here.
- Fall 2021* Introduction to Algebra
Covered 2 weeks of lectures & exercise sessions during professor's paternity leave

Tutorials

- Spring 2022* Linear Algebra and Geometry II
- Fall 2021* Groups and Symmetries
- Fall 2016* Differential Equations with Linear Algebra
- Spring 2016* Algebraic Structures II
- Fall 2015* Algebraic Structures I
- Fall 2013* Differential Calculus for Scientists
- Spring 2013* Differential Calculus
- 2010 - 2013* Introduction to Modern Physics

Directed Reading Program mentor

- Spring & Fall 2014* Guiding an undergraduate math student through an independent study. Topics
Spring 2016 included cluster varieties, mathematical physics, and representation theory.

Seminars and Conferences Organized:

Conferences:

Mirror Symmetry for Cluster Varieties and Representation Theory (co-organizer, to be held June 2024)

Seminars:

- Fall 2023 - Spring 2024* King's College London Geometry Seminar (co-organizer)
- Fall 2020* Symplectic Cut Seminar (co-organizer)
- Fall 2019 - Spring 2020* Birmingham Geometry and Mathematical Physics Seminar

Grants:

Researcher co-I on EPSRC grant (£460,000)
 LMS Scheme 5 (£2721)

Students:

Edward Quilty (MSci co-supervisor, graduated 2020)

Selected Research Talks:

- 5 May 2023:* Fanosearch seminar
Imperial College London, UK

- 22 Mar 2023: Algebra and Number Theory seminar
University of Glasgow, UK
- 8 Dec 2022: Toric Degenerations worksop
Banff International Research Station, Canada
- Nov 2022: Mini-course: From toric varieties to cluster varieties
Centro de Ciencias Matemáticas UNAM Campus Morelia, Mexico
- 25 May 2022: Bridges between representation theory and algebraic geometry conference
University of Leeds, UK
- 13 Apr 2021: Bath Algebra, Geometry and Number Theory seminar
University of Bath, UK
- 19 Feb 2021: Geometry & Topology seminar
Imperial College London, UK
- 4 Dec 2020: Conferencias en Geometría Algebraica
Centro de Ciencias Matemáticas, UNAM Campus Morelia, Mexico
- 10 Mar 2020: University of Edinburgh Algebra seminar
University of Edinburgh, UK
- 27 Feb 2020: MFO Mini-Workshop: Superpotentials in Algebra and Geometry
Oberwolfach, Germany
- 21 Jan 2020: University of Warwick Algebraic Geometry seminar
University of Warwick, UK
- 9 Oct 2019: King's College London Geometry seminar
King's College London, UK
- 16 Jul 2019: 5CinG workshop: Mirror symmetry and cluster algebras
University of Cambridge, UK
- 10 Jul 2019: SIAM Conference on Applied Algebraic Geometry: Cluster Algebras and Positivity
Universität Bern, Switzerland
- 28 May 2019: Cambridge Algebraic Geometry Seminar
University of Cambridge, UK
- 1 Nov 2018: Rutgers Geometry, symmetry, and physics seminar
Rutgers University, New Brunswick, New Jersey, USA
- 23 Oct 2018: Harvard Algebraic geometry seminar
Harvard University, Cambridge, Massachusetts, USA
- 21 Oct 2018: AMS Special Session: Cluster algebras, Poisson geometry, and related topics
University of Michigan, Ann Arbor, Michigan, USA
- 8-9 May 2018: Lecture series at CINVESTAV (5h)
CINVESTAV, Mexico City, Mexico
- 23 Mar 2018: Frobenius structures and relations workshop
University of Glasgow, UK
- 15 Mar 2018: Tropical Geometry meets Representation Theory workshop
Universität zu Köln, Cologne, Germany
- 30 Jan 2018: Cluster varieties and mathematical physics workshop
Casa Matemática Oaxaca, Mexico
- 30 Nov 2017: US-Mexico Conference of Representation Theory, Categorification, and Non-commutative Algebra, *Instituto de Matemáticas de la UNAM, Mexico City*