Timothy Magee

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Employment:

2024 - present: Hollins University *(Visiting Assistant Professor)*

2020 - 2024:[1]   King's College London *(Research Associate)*

Feb - Aug 2021:   Imperial College London *(Research Associate)*

2018 - 2020:   University of Birmingham *(Research Associate)*

2017 - 2018:   Instituto de Matemáticas de la UNAM Unidad Oaxaca *(Research Associate)*

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:

Valuative independence and cluster theta reciprocity
    Joint with M.-W. Cheung, T. Mandel, and G. Muller
    arXiv:2505.09585 [math.AG]

Fundamentals of broken line convex geometry
    Joint with J. B. Frías-Medina
    arXiv:2407.02427 [math.AG]

Newton–Okounkov bodies and minimal models for cluster varieties
    Joint with L. Bossinger, M.-W. Cheung, and A. Nájera Chávez
    arXiv:2305.04903 [math.AG]   Journal: Advances in Mathematics

Quantization of deformed cluster Poisson varieties
    Joint with M.-W. Cheung and J. B. Frías-Medina
    arXiv:2007.02479 [math.QA]   Journal: Algebras and Representation Theory

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[1]Excluding 7 months at Imperial College London

Compactifications of cluster varieties and convexity
    Joint with M.-W. Cheung and Nájera Chávez
    arXiv: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 [math.AG]   Journal: Compositio Mathematica

Littlewood-Richardson coefficients via mirror symmetry for cluster varieties
    arXiv: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 [math.AG]

Teaching:

Lectures

Spring 2026	Abstract Algebra II – Rings, Modules, and Algebras
	Quantitative Reasoning in Today's World
	Calculus II
Fall 2025	Mathematical Modeling with Precalculus
	Transition to Advanced Mathematics
	Several Variable Calculus
Summer 2025	Hyperbolic Trigonometry and Special Relativity
	Designed and taught masters course for high school teachers.
Spring 2025	Quantitative Reasoning in Today's World ($\times 2$)
	Calculus II
	Laboratories in Mathematical Experimentation (team taught with Molly Lynch)
Fall 2024	Introduction to Quantitative Reasoning
	Transition to Advanced Mathematics
	Several Variable Calculus
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

Guided Reading

Since Fall 2024	12 Points Theorem Reading Group
	Team lead with J. B. Frías-Medina. Undergraduates at both of our universities are learning about an interesting result in 2D convex geometry. Later, we will advise them as they attempt to show a new broken line convex geometry version of this result.
Fall 2025, Spring 2026	Advising senior project
	Soledad Ruggiero is reading about finite fields and will study the geometry of the card game "Set".

Spring 2025	Advised senior project
	Rhyann Wilson studied differential forms in electromagnetic theory for her senior project.
Spring, Fall 2014	Directed Reading Program
Spring 2016	*Guided undergraduates though independent study. Topics included cluster varieties, mathematical physics, and representation theory.*

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

Students:

Edward Quilty (MSci co-supervisor, graduated 2020)

Seminars and Conferences Organized:

Conferences:

| *June 2024* | Mirror Symmetry for Cluster Varieties and Representation Theory (co-organizer) |

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)

Selected Research Talks:

2 Dec 2025:	The Department of Mathematics, Computer Science and Physics Conversation Series
	Roanoke College, Roanoke, Virginia, USA
18 Oct 2024:	UK Algebra seminar
	University of Kentucky, Lexington, Kentucky, USA
7 Mar 2024:	Bath Algebra, Geometry and Number Theory seminar
	University of Bath, Bath, UK
15 Feb 2024:	COW algebraic geometry meeting
	University of Essex, Essex, UK

5 May 2023:	Fanosearch seminar *Imperial College London, London, UK*
22 Mar 2023:	Algebra and Number Theory seminar *University of Glasgow, Glasgow, UK*
8 Dec 2022:	Toric Degenerations worksop *Banff International Research Station, Banff, 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, Leeds, UK*
13 Apr 2021:	Bath Algebra, Geometry and Number Theory seminar *University of Bath, UK*
4 Dec 2020:	Conferencias en Geometría Algebraica *Centro de Ciencias Matemáticas, UNAM Campus Morelia, Mexico*
3 Dec 2020:	University of Nottingham Algebraic Geometry seminar *University of Nottingham, UK*
10 Mar 2020:	University of Edinburgh Algebra seminar *University of Edinburgh, 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, Warwick, UK*
16 Jul 2019:	5CinG workshop: Mirror symmetry and cluster algebras *University of Cambridge, Cambridge, UK*
10 Jul 2019:	SIAM Conference on Applied Algebraic Geometry: Cluster Algebras and Positivity *Universität Bern, Bern, Switzerland*
28 May 2019:	Cambridge Algebraic Geometry Seminar *University of Cambridge, 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*
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, Oaxaca, Mexico*
19 Dec 2017:	3ra Escuela de Invierno de Matemáticas en Oaxaca *Instituto de Matemáticas de la UNAM, Oaxaca, Mexico*
30 Nov 2017:	US-Mexico Conference of Representation Theory, Categorification, and Non-commutative Algebra, *Instituto de Matemáticas de la UNAM, Mexico City, Mexico*