

Unit Name

Representation Theory and Algebraic Combinatorics Unit
Associate Professor Liron Speyer

Collaborations

Sinéad Lyle, University of East Anglia, UK, Schurian-finiteness of blocks of type B Hecke algebras

Susumu Ariki, Osaka University (Emeritus), Japan, Schurian-finiteness of blocks of type B Hecke algebras

Qi Wang, Dalian University of Technology, China, Schurian-finiteness of blocks of type B Hecke algebras

Chris Bowman, University of York, UK, Morita equivalences between cyclotomic KLR algebras in types \mathcal{C}_∞ and \mathcal{A}_∞

Robert Muth, Duquesne University, USA, Morita equivalences between cyclotomic KLR algebras in types \mathcal{C}_∞ and \mathcal{A}_∞

Andrew Mathas, University of Sydney, Australia, Graded decomposition matrices of cyclotomic quiver Hecke algebras in type C

Robert Muth, Duquesne University, USA, Cyclotomic KLR algebras and cyclotomic wreath zigzag algebras

Robert Muth, Duquesne University, USA, A skew Specht perspective of RoCK blocks and cuspidal systems for KLR algebras in affine type A

Research Personnel

Louise Sutton, Staff Scientist

Kaveh Mousavand, Staff Scientist

Pablo Sanchez Ocal, Postdoctoral Scholar, Postdoctoral research fellow at The University of British Columbia

Kaveh Mousavand, Postdoctoral Scholar, Promoted to Staff Scientist

Duc Khanh Nguyen, Postdoctoral Scholar, Postdoc position at Vietnam Institute for Advanced Study in Mathematics from January 2026

Pavel Turek, JSPS Postdoctoral Fellow

Kyle Stanley Grant, PhD Student

Martin Forsberg Conde, PhD Student

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Speyer, L.
The Minimal Counterexample to James's Conjecture.
2. Speyer, L.
Wild Blocks of Type A Hecke Algebras Are Strictly Wild. *Bulletin of the London Mathematical Society* 2025, 57, 2658–2679.
3. Muth, R.; Nicewicz, T.; Speyer, L.; Sutton, L.
A Skew Specht Perspective of RoCK Blocks and Cuspidal Systems for KLR Algebras in Affine Type A. *Representation Theory* 2025, 29, 718–788.

- Ariki, S.; Lyle, S.; Speyer, L.; Wang, Q.
Schurian-Finiteness of Blocks of Type B Hecke Algebras.

Poster Presentation at Conference

- Muth, R.; Nicewicz, T.; Speyer, L.; Sutton, L.
Simple Modules for Affine Type A KLR Algebras via Skew Specht Modules. Formal Power Series and Algebraic Combinatorics (FPSAC 2025) 2025.

Presentation at Conference

- Speyer, L.
Schurian-Infinite Blocks of Hecke Algebras of Types A and B. Newton Satellite Programme: Geometric and Categorical Lie theory 2025.
- Speyer, L.
A New Construction of Simple Modules for Type A KLR Algebras. Hecke algebra day 2025.

Seminars

- Speyer, L.
Hecke Algebras, KLR Algebras, and James's Conjecture. 2026.
<https://sites.google.com/view/jhutopology/spring-2026>
- Speyer, L.
Hecke Algebras, KLR Algebras, and James's Conjecture. 2026.
- Speyer, L.
Hecke Algebras, KLR Algebras, and James's Conjecture.
<https://www.maths.usyd.edu.au/u/AlgebraSeminar/>
- Speyer, L.
Symmetric Groups, Hecke Algebras, and KLR Algebras.
<https://math.xula.edu/MAX/Fall2025.html>

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Year Pub
Konrad Aguilar, Angelynn Álvarez, René Ardila, Pablo S. Ocal (OIST), Cristian Rodríguez Avila, Anthony Várilly-Alvarado	Journal Article	Locally recoverable algebro-geometric codes with multiple recovery sets from projective bundles	Designs, Codes and Cryptography	
Sota Asai, Osamu Iyama, Kaveh Mousavand (OIST), and Charles Paquette	Journal Article	Brick-splitting Torsion Pairs and Left Modularity	arXiv	
Kaveh Mousavand (OIST), Charles Paquette	Journal Article	Geometric interactions between bricks and τ -rigidity	arXiv	
Martín Forsberg Conde	Journal Article	A generalization of Carter-Payne homomorphisms	arXiv	
David Chan, Myungsin Cho, David Mehrle, Pablo S. Ocal (OIST),	Journal Article	Realizing compatible pairs of transfer systems by	arXiv	

Name of Unit Member	Type	Title	Outlet	Year Pub
Angélica M. Osorno, Ben Szczesny, Paula Verdugo		combinatorial N_{∞} -operads		
Matthew Fayers & Eoghan McDowell (OIST)	Journal Article	Spin characters of the symmetric group which are proportional to linear characters in characteristic 2	Annals of Representation Theory	
Kaveh Mousavand (OIST) and Charles Paquette	Journal Article	On the bricks (Schur representations) of finite dimensional algebras	arXiv	
David Chan, Myungsin Cho, David Mehrle, Pablo S. Ocal (OIST), Angélica M. Osorno, Ben Szczesny, Paula Verdugo	Journal Article	Realizing compatible pairs of transfer systems by combinatorial N -infinity-operads	arXiv	
Kaveh Mousavand (OIST) & Charles Paquette	Journal Article	Hom-orthogonal modules and brick-Brauer–Thrall conjectures	Journal of Algebra	
Spencer Daugherty, Nicolle González, Bárbara Muniz, Pablo S. Ocal (OIST), Jianping Pan, Jacinta Torres	Journal Article	Structure and geometry of the tableaux algebra	arXiv	
Duc-Khanh Nguyen	Journal Article	Branching rule on winding subalgebras of affine Kac-Moody algebras	arXiv	
Kaveh Mousavand	Journal Article	Biserial algebras and generic bricks	Mathematische Zeitschrift	2025
Mark Deaconu, Kaveh Mousavand (OIST) and Charles Paquette	Journal Article	Infinite string bricks and Sturmian words over some gentle algebras	arXiv	
Duc-Khanh Nguyen	Poster Presentation at Conference	On the shifted Littlewood-Richardson coefficients and Littlewood-Richardson coefficients	École thématique du CNRS ARTinTOKYO	
Kaveh Mousavand	Presentation at Conference	Recent developments on brick-Brauer-Thrall conjectures	Quivers in Representation Theory, Chennai Mathematical Institute, India	
Pablo Ocal	Presentation at Conference	Deformations of Frobenius algebras and noncommutative 2d topological quantum field theories	Algebraic Lie Theory and Representation Theory (ALReT) 2025, Kanazawa	
Duc-Khanh Nguyen	Presentation at Conference	A generalization of the Murnaghan-Nakayama rule for k - k -Schur and k -Schur functions	Workshop on Mirror Symmetry and Related Topics, Kyoto 2025	

Name of Unit Member	Type	Title	Outlet	Year Pub
Duc-Khanh Nguyen	Presentation at Conference	Branching rule on winding subalgebras of affine Kac-Moody algebras	Confluence of combinatorics and representation theory	
Duc-Khanh Nguyen	Presentation at Conference	Branching rule on winding subalgebras of affine Kac-Moody algebras	Symposium on Representation Theory 2025, Kanagawa Institute of Technology	
Pablo Ocal	Presentation at Conference	The Ziegler spectrum of a discrete valuation ring	Large modules and endofiniteness Winter School, University of Stuttgart	
Kaveh Mousavand	Presentation at Conference	Hom-orthogonal modules and brick-Brauer-Thrall conjectures	Perspectives in Tilting Theory and Related Topics, RIMS, Kyoto	
Kaveh Mousavand	Presentation at Conference	Hom-orthogonal modules, bricks and representation varieties	Topological Data Analysis and Representation Theory, Kobe	
Louise Sutton	Presentation at Conference	Cyclotomic KLR algebras in types A_{∞} and C_{∞}	AMS Spring Eastern Sectional Meeting: Special Session on Advances in Representation Theory, Combinatorics, and Interactions with Machine Learning	
Louise Sutton	Presentation at Conference	Cyclotomic KLR algebras in types A_{∞} and C_{∞}	Algebraic Lie Theory and Representation Theory (ALReT) 2025, Kanazawa	
Duc-Khanh Nguyen	Presentation at Conference	A generalization of the Murnaghan-Nakayama rule for k - k -Schur and k -Schur functions	Algebraic Lie Theory and Representation Theory (ALReT) 2025, Kanazawa	
Martín Forsberg Conde	Presentation at Conference	A 型 KLR 代数における拡張 Carter–Payne 準同型	Recent Development on Representation Theory, Lie theory and Related Areas	
Duc-Khanh Nguyen	Presentation at Conference	A Murnaghan-Nakayama rule for Grothendieck polynomials of Grassmannian type	Recent Development on Representation Theory, Lie theory and Related Areas	
Pablo Ocal	Presentation at Conference	Warped tensor products and noncommutative 2d topological quantum field theories	Recent Development on Representation Theory, Lie theory and Related Areas	
Kaveh Mousavand	Presentation at Conference	Directedness of indecomposables, bricks, and spread (interval) modules	Topological Data Analysis and Representation Theory, Kobe	
Kaveh Mousavand	Presentation at Conference	Brick-directed algebras and their applications	Program on Combinatorics, Geometry, and Representation Theory, ICTS Bangalore, India	
Kaveh Mousavand	Presentation at Conference	Minimal brick-infinite tame algebras	35th Meeting on the Representation Theory of Algebras and Related Topics, Sherbrooke	

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Kaveh Mousavand	Presentation at Conference	Hom-orthogonal modules and brick-Brauer-Thrall conjectures	Perspectives in Tilting Theory and Related Topics, RIMS, Kyoto	
Kaveh Mousavand	Presentation at Conference	Hom-orthogonal modules, bricks and representation varieties	Topological Data Analysis and Representation Theory, Kobe	
Pablo Ocal	Seminars	Locally recoverable codes from projective spaces	Quantum Engineering and Design Unit at OIST	
Pablo Ocal	Seminars	Deformations of Frobenius algebras and noncommutative 2d topological quantum field theories	Mathematics with Computer Science Colloquium of the Guangdong Technion Israel Institute of Technology	
Kaveh Mousavand	Seminars	Hom-orthogonal modules and geometry of representation varieties	Joint UOttawa-Carleton Algebra Seminar	
Kaveh Mousavand	Seminars	A combinatorial proof of the (strong) semibrick conjecture for biserial algebras	Laboratoire d'Algèbre, de Combinatoire et d'Informatique Mathématique (LACMI), Montréal	
Kaveh Mousavand	Seminars	Algebraic and geometric distribution of bricks	Algebraic and Geometric Seminar (SAG) at Sherbrooke University, Sherbrooke	
Pablo Ocal	Seminars	Warped tensor products and noncommutative 2d topological quantum field theories	UC Berkeley Representation theory and tensor categories seminar	
Pablo Ocal	Seminars	The tableaux algebra, with applications to geometry and crystals	Algebra and Combinatorics Seminar of Texas A&M University	
Pablo Ocal	Seminars	Algebras of semistandard Young tableaux with applications to geometry and crystals	Postdoctoral and Graduate Student Seminar of the program Categorification and Computation in Algebraic Combinatorics happening at the Institute for Computational and Experimental Research in Mathematics	
Kaveh Mousavand	Seminars	Short-cycles in representation varieties	Topology and Geometry Seminar, University of Regina, Canada	
Pablo Ocal	Seminars	Locally recoverable codes from projective spaces	Quantum Engineering and Design Unit Seminar, OIST	
Duc-Khanh Nguyen	Seminars	On the shifted Littlewood-Richardson coefficients and Littlewood-Richardson coefficients	Tsukuba University Algebra seminar	
Pablo Ocal	Seminars	Locally recoverable codes from projective spaces	Networked Quantum Devices Unit, OIST	

Honors, Awards & Fellowships

Term 2 2026 - Ongoing Sydney Mathematical Research Institute International Visitor Program, N/A, 2024, Sydney Mathematical Research Institute (SMRI) [Fiscal Year: 2026-02-02]

Honors, Awards & Fellowships [By Unit Members Only]

Term 2 2026 - Ongoing Pavel Turek, JSPS Postdoctoral Fellowship for Research in Japan (Short-term), 日本学術振興会外国人特別研究員（短期）, 2025, JSPS, N/A [Fiscal Year: 2026-01-13]

Term 1 2025 - Ongoing Kaveh Mousavand, Tomlinson Fellowship, N/A, 2025, Visiting Scholar Funding Allocation, Bishop's University, Canada, N/A [Fiscal Year: 2025-09-01]

External Service

Term 3 2025 - Term 3 2025 TSVP Thematic Program "TDA PARTI - Topological Data Analysis, Persistence And Representation Theory Intertwined", Our postdoc Kaveh Mousavand is one of the organisers for this upcoming TSVP Thematic Program [Fiscal Year: 2025-06-23]

Term 2 2020 - Ongoing Refereeing for journals, I am regularly asked to referee papers for mathematics journals. I have refereed approx. 20 papers for journals including top-tier general audience journals (incl. International Mathematics Research Notices, Mathematische Zeitschrift, Journal of the London Mathematical Society) and top-tier algebra journals (incl. Representation Theory, Journal of Algebra). [Fiscal Year: 2020-02-01]

Other Institutional Service

Term 3 2025 - Term 3 2025 Onna×OIST Children's School of Science program, (University) [Fiscal Year: 2025-08-08]

Outreach Activities [For Unit Members Only]

Term 3 2025 Pablo Ocal, Onna×OIST Children's School of Science program [Fiscal Year: 2025-08-08]

Term 3 2025 Louise Sutton, Onna×OIST Children's School of Science program [Fiscal Year: 2025-08-08]Topology

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Co-Organizers	Date
OIST Organisers: Kaveh Mousavand and Pablo Ocal	Spectrums in Representation Theory of Algebras and Related Topics	Osaka Central Advanced Mathematical Institute (OCAMI)	Ryo Kanda	2026-01-01
Emerson Escolar	Representation Theory and (Barcoding) Invariants for Persistence	L4F01, OIST and online		2025-04-22
Vyacheslav Futorny	Smooth representations of Affine Lie algebras	L4F01, OIST and online		2025-04-03
Iryna Kashuba	Southern University of Science and Technology	L4F01, OIST and online		2025-04-03