

# EMİNE YILDIRIM

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## EDUCATION

*Ph.D. in Mathematics,*  
Université du Québec à Montréal, Canada. August 2015–May 2018  
Advisor : Hugh Thomas

*MSc. in Mathematics,*  
Abant İzzet Baysal University, Turkey. February 2010–June 2011  
Advisor : Tahire Özen Öztürk

*BSc. in Mathematics,*  
Abant İzzet Baysal University, Turkey. September 2006–January 2010

## WORK EXPERIENCE

*R3 Established Researcher*  
International Center for Mathematical Sciences (ICMS) - Sofia August 2025–present

*Research Fellow*  
University of Leeds, UK October 2022–July 2025

*INI-Simons Postdoctoral Fellow*  
Isaac Newton Institute (INI); University of Cambridge October 2021–September 2022

*Coleman Postdoctoral Fellow*  
Queen's University, Canada July 2018–June 2021

*Teaching Assistant*  
University of New Brunswick, Canada January 2014–August 2015

*Lecturer*  
İstanbul Arel University, Turkey September 2012–December 2013

## PAPERS

F. Campanini, F. Fedele, E. Yıldırım, *Lattices of pretorsion classes*, arXiv:2511.19223.

C. Paquette, J. D. Rock, and E. Yıldırım, *Categories of generalized thread quivers*, arXiv:2410.14656.

K. Baur, L. Bittmann, E. Gunawan, G. Todorov, and E. Yıldırım, *Infinite friezes of affine type  $D$* , arXiv:2407.11232, Accepted to *Combinatorial Theory*.

I. Le and E. Yıldırım, *Cluster Categorification of Rank 2 Webs*, arXiv:2402.14501.

A. Felikson, P. Tumarkin and E. Yıldırım, *Polytopal realizations of non-crystallographic associahedra*, Algebraic Combinatorics, Volume 8, issue 1 (2025), 17-28.

E. Kantarcı Oğuz and E. Yıldırım, *Cluster Expansions: T-walks, Labeled Posets and Matrix Calculations*, Journal of Algebra (2025), Vol. 669, 183-219.

R. Marczinzik, H. Thomas, and E. Yıldırım, *On the interaction of the Coxeter transformation and the Rowmotion bijection*, Journal of Combinatorial Algebra 8 (2024), 359–374.

C. Paquette and E. Yıldırım, *A Completion of Discrete Cluster Categories of type A*, Transactions of the London Mathematical Society (2021), 8(1), 35–64.

V. Bazier-Matte, N. Chapelier-Laget, G. Douville, K. Mousavand, H. Thomas, and E. Yıldırım, *ABHY associahedra and Newton polytopes of F-polynomials for cluster algebras of simply laced finite type*. Journal of the London Mathematical Society (2) 2024, 109 (1), Paper No. e12817, 27.

V. Bazier-Matte, G. Douville, A. Garver, R. Patrias, H. Thomas, and E. Yıldırım, *Leading Terms of  $SL_3$  Web Invariants*. International Mathematics Research Notices, (2020), rnaa110.

T. Brüstle, G. Douville, K. Mousavand, H. Thomas, and E. Yıldırım, *On the combinatorics of gentle algebras*. Canadian Journal of Mathematics (2020), 72 (6), 1551-1580.

E. Yıldırım, *Coxeter transformation on cominuscule posets*. Algebra and Representation Theory (2019), 22 (3), 699-722.

T. Özen and E. Yıldırım,  *$\mathcal{X}$ -Injective and  $\mathcal{X}$ -Projective Complexes*. Bulletin of Iranian Mathematical Society (2016), 42 (5), 1221-1235.

## OTHER

K. Baur and E. Yıldırım, *Cluster Algebras*, Encyclopedia of Mathematical Physics 2nd edition, book title: Reference Module in Materials Science and Materials Engineering, 2023.

*Cluster Expansion via matrices*, Oberwolfach Report for Cluster Algebras and Its Applications, 2024.

*Webs and  $Gr(3,n)$* , Oberwolfach Report for the Arbeitsgemeinschaft: Cluster Algebras, 2023.

## AWARDS/ GRANTS

- Bulgarian National Science Foundation grant (Contract No: KP-06-N92/5), ICMS - Sofia.
- International Mobility Grant, University of Leeds.

- Academic Development Fellowship, University of Leeds.
- London Mathematical Society Scheme 5: ‘Collaborations with Developing Countries’ grant.
- International Congress of Mathematicians 2022 travel grant (award not used since the conference moved to online).
- Invitation/Fund to Hausdorff Junior Trimester Program on ‘New Trends in Representation Theory’ (award declined due to COVID-19/travel restrictions).
- Queen’s University Post-Doctoral Travel Award, 2018.
- Institut des Sciences Mathématiques (ISM) Scholarships for Outstanding PhD Candidates, 2018.
- ISM Travel Grant, 2018.
- ISM Graduate Scholarships at UQAM from 2016 to 2018.
- Tuition Exemption Scholarships at UQAM from 2015 to 2018.

## **ORGANIZING**

I am/was a co-organizer of the following conference and seminars.

- Quantum Groups and Cluster Algebras II, ICMS - Sofia, August 2026.
- Celebrating Women in Representation Theory, ICMS - Sofia, May 2026.
- Farey’s legacy in frieze patterns and discrete geometry, ICMS - Edinburg, April 2026.
- Quantum Groups and Cluster Algebras, ICMS - Sofia, December 2025.
- Inclusion, Diversity, and Equity in Algebra, University of Leeds, October 2025.
- AESIM Summer School on Markov Numbers and Cluster Algebras, İstanbul, August 2025.
- CLAN (Clusters and their Applications in the North), 2024-2025.
- Algebra seminars, University of Leeds, February 2023 - June 2024.
- The Advances in Representation Theory of Algebras IX, Queen’s University, June 2023.
- Cluster algebras and Representation Theory Seminars at Isaac Newton Institute, September-December 2021.
- Virtual Advances in Representation Theory of Algebras 2021 - Online Conference in Honor of Andrzej Skowroński, May 17-May 28 2021.
- Algebra & Geometry Working Seminars, Queen’s University, 2020-2021.
- Geometry and Representation Theory Seminars, Queen’s University, 2019-2020.
- Quantum Groups Learning Seminars, Queen’s University, 2019-2020.

## TEACHING

### University of Leeds, United Kingdom:

- **(Advanced) Commutative Rings and Algebraic Geometry in 2024 & 2025**

I was a module leader of the course which consists of a mix of undergraduate and master students.

- **Projects in Mathematics in 2022-2023**

This is a year long course for students to carry out independent research. I co-supervised 5 students for different projects in the research area of “*Friezes*.”

### Queen’s University, Kingston, Canada:

- **Vector Calculus** in the Fall semesters of 2018; 2019; 2020.

I was the only instructor, thus the coordinator, of this course each semester.

- **Rings and Fields** in the Winter semester 2019.

This was a coordinated course and I was responsible from preparing and giving lectures for my section.

- **Linear Algebra** for the Winter semester 2020; 2021.

This was a coordinated course and I was the coordinator of the online course in 2021.

### University of New Brunswick, Fredericton, Canada:

- From January 2014 to June 2015, I worked as a teaching assistant for introductory calculus classes.

- In addition, I worked as a tutor at the Math Help Center.

### İstanbul Arel University, İstanbul, Türkiye:

- From September 2012 to December 2013, I was a full time lecturer.

## SUPERVISING

- Alex Southworth, *Rowmotion*, 2025, Summer Bursary Scheme at the University of Leeds.

- Brennan Smith, *Polytopes: A Combinatorial Approach*, 2025, Master project at the University of Leeds.

- Julia Hörmayer, *Cluster Categories from non-uniform Postnikov diagrams*, 2023-2024, PhD supervision at the University of Leeds.

- İlknur Öztürk, *Root Systems and Reflection Groups*, summer 2023, Directed Reading Program Türkiye.

- Temi Abbass, *Triangulations and Friezes in three dimensions*, summer 2022, In2Research Program at the University of Cambridge.

- Zeliha Sevgi, *Quiver Representations*, summer 2022, Directed Reading Program Türkiye.

- Aysel Şahin, *Conway-Coxeter Friezes and related combinatorics*, summer 2021, Directed Reading Program Türkiye.

- Elifnaz Gülsen, *Quiver representations and their interaction with algebra and combinatorics*, one semester in 2019, Directed Reading Program Queen's University.
- Molly Liu, *Cluster algebras and combinatorics*, one semester in 2019, Directed Reading Program Queen's University.

## ACTIVITIES

I am/was a

- EDI postdoc representative in the University of Leeds, 2024-2025.
- Jury member of the PhD defense by Tal Gottesman.
- co-leader at the workshop "Women in Noncommutative Algebra and Representation Theory 4", Banff International Research Station, March 23 – 28, 2025.
- host In2Stem Program for 4 high school students at the University of Leeds between 5-9 August 2024.
- host in the In2Science Program for 6 high school students at the University of Leeds between 7-11 August 2023.
- mentor in Directed Reading Program Türkiye in the summer of 2021, 2022 & 2023.
- co-founder of the Maths Support Platform which provided academic resources, support and mentoring in math for undergraduate students who were affected by the major earthquake of February 2023 in Türkiye.
- mentor in Cambridge for 3 female undergraduate students in 2022.
- volunteer in the Mathematics Festival in Istanbul, 14-15 May 2022.

## Research Visits

- Eleonore Faber, University of Graz, 25-30 January 2026.
- Daisie Rock, University of Ghent, 17-24 May 2025.
- Léa Bittmann, University of Strasbourg, 30 September - 4 October 2022.
- Charles Paquette, Queen's University, 26 May - 26 June 2023.
- Esther Banaian, Aarhus University, 14-18 February 2023.
- Léa Bittmann, University of Edinburgh, 29 November - 1 December 2022.
- Anna Felikson and Pavel Tumarkin, Durham University, 15-18 July 2022.
- Alastair King, University of Bath, 3-5 May 2022.
- Ana Garcia Elsener, University of Glasgow, 9-12 April 2021.
- Ibrahim Assem, University of Sherbrooke, 30 June - 6 July 2019.
- Ralf Schiffler, University of Connecticut, 29 October - 3 November 2017.

## PRESENTATIONS

- *Pretorsion theory in module categories*, Algebra & Geometry Seminar, University of Graz, January 2026.
- *Lattice of Pretorsion classes*, Flash Talks in Representation Theory VI, January 2026.
- *Cluster Structures, Lecture Series I, II, III*, Summer School on Markov Numbers and Cluster Algebras, August 2025.
- *Understanding algebras via geometry and combinatorics, Lecture Series I, II, III*, Rings, Modules and Algebras 11th edition, Bursa Technical University, July 2025.
- *Frieze patterns of affine type D* AlCoVE: an Algebraic Combinatorics Virtual Expedition, May 2025.
- *Growth of frieze patterns*, Frieze patterns in algebra, combinatorics and geometry, CIRM, May 2025.
- *Posets in the combinatorics of cluster algebras*, Algebra seminar, University of Georgia, April 2025.
- *Categorification of webs*, Algebra seminar, University of York, February 2025.
- *Getaways to Friezes*, Poster presentation in the Okinawa Institute of Science and Technology (OIST), November 2024.
- *Surface triangulations and Friezes*, Pure Maths Seminar, University of East Anglia, November 2024.
- *Thread quivers*, Women in Representation Theory: quivers, mutations, and beyond, Bielefeld University, September 2024.
- *From Triangulations to Friezes and Cluster Algebras*, Mathematics Department Seminar at Yeditepe University, May 2024 (online).
- *Thread quivers*, Pure Maths Seminar at Lancaster University, May 2024.
- *Exploring Combinatorial Windmills across Algebraic Landscape*, Algebra and Number Theory seminar at the University College Dublin, April 2024.
- *Matrix computation of cluster expansions*, Continued Fractions and  $SL_2$ -tilings, Durham University, March 2024.
- *Why the Return to Pictures in Algebra?*, Pure maths colloquium, University of Sheffield, March 2024.
- *Cluster Expansion via matrices*, Cluster Algebra and Its Applications, Oberwolfach, January 2024.
- *Webs and  $Gr(3,n)$* , Arbeitsgemeinschaft: Cluster Algebras, Oberwolfach, October 2023.
- *Friz Desenlerin Cebirsel Yorumu*, 35. National Mathematics Symposium, Trakya University, Turkey, September 2023.
- *Friezes*, Combinatorial Representation Theory in Leeds, University of Leeds, July 2023.
- *Growth of frieze patterns*, Cluster Structures in the North 2023, University of Central Lancashire, Preston, June 2023.

- *Cluster Expansions via matrices*, Combinatorial aspects of Representation Theory, Norwegian Academy of Sciences and Letters in Oslo, March 2023.
- *Computing Cluster Expansions via matrices*, Glasgow Algebra and Number Theory seminar, University of Glasgow, March 2023.
- *Cluster Expansion via matrices*, Aarhus Homological Algebra Seminar, Aarhus University, February 2023.
- *Categories from Poset Quivers*, Algebra seminar, University of Manchester, December 2022.
- *Poset Quivers*, Algebra seminar, University of Leeds, October 2022.
- *Poset Quivers*, Geometric and combinatorial methods in homological algebra, Aarhus University, July 2022.
- *Cluster-tilting subcategories*, Bridges between representation theory and algebraic geometry: Singularities, friezes and cluster categories, University of Leeds, May 2022.
- Cluster categories: classical, discrete and beyond, Algebra seminar, University of Bath, May 2022.
- What is a connection between cluster algebras and friezes?; with Emily Gunawan, The Banff International Research Station, April 2022.
- *Periodic actions*, Bilkent Algebra Seminar, February 2022 (online).
- *Periodic actions on distributive lattices and counterparts in algebra*, FD Seminar, November 2021 (online).
- *Cluster structures*, New developments in Representation Theory arising from Cluster Algebras, Isaac Newton Institute, September 2021 (online).
- *The manifestations of Rowmotion in Representation Theory of Algebras*, Summer School of Algebraic Combinatorics, June 2021 (online).
- *Composition of the rowmotion and the Coxeter transformation*, Virtual Advances in Representation Theory of Algebras, May 2021 (online).
- *Webs and Modules*, TRAC Online Seminars, University of Sherbrooke, April 2021 (online).
- *Generalized Associahedra*, Algebra Seminar, University of Leeds, March 2021 (online).
- *Tilting theory and Quiver mutation*, LPA Seminars, Turkey, February 2021 (online).
- *Discrete cluster categories of type A and beyond*, Flash Talks in Representation Theory, NTNU, January 2021 (online).
- *The orbits of the Coxeter Transformation and Rowmotion for cominuscule posets*, Dynamical Algebraic Combinatorics, Banff International Research Station, October 2020 (online).
- *Graphs and Combinatorics in Representation Theory of Algebras.*, Queen's University Colloquium, October 2020 (online).
- *Associahedra and Quiver Representations*, Gebze Technical University, October 2020 (online).

- *The Coxeter Transformation and Rowmotion for cominuscule posets*, Kentucky Discrete Math Seminar, September 2020 (online).
- *Cluster categories*, Uluslararası Cebirsel Geometri Neşesi, 2020 (online).
- *Cluster categories capturing combinatorics of infinite cluster variables*, Algebra Seminar, University of Sherbrooke, Quebec, February 2020.
- *The Coxeter Transformation and Promotion*, Algebra Seminar, University of Toronto, Toronto, January 2020.
- *A completion of discrete cluster categories of type A*, Seventh Conference on Geometric Methods in Representation Theory, University of Missouri, Columbia, November 2019.
- *Rowmotion and Coxeter transformation*, Applied Algebra Seminar, York University, Toronto, September 2019.
- *A slight extension of discrete cluster categories*, Cluster Algebras and Quiver Representations, Centre de Recherches Mathématiques (CRM), August 2019.
- *Cluster categories for an infinite rank cluster algebra*, Summer Day of Representation Theory of Algebras, Université de Sherbrooke-Bishop's University, QC, July 2019.
- *The bounded derived category for cominuscule posets*, Maurice Auslander Distinguished Lectures and International Conference, Woods Hole, MA, April 2019.
- *The Web Basis and Preprojective Algebras*, American Mathematical Society Sectional Meeting, Hartford, CT, April 2019.
- *Associahedra and Newton Polytopes of F-Polynomials*, Cluster structures in geometry, physics, combinatorics and representation theory, Jerusalem, December 2018.
- *The bounded derived category for cominuscule posets*, Algebra seminar, Queen's University, Kingston, ON, September 2018.
- *Generalized Associahedra and Newton polytopes of F-polynomials*, Algebra seminar, Carleton University, Ottawa, ON, September 2018.
- *Associahedra via quiver representations*, Canadian Mathematical Society Summer Meeting, Fredericton, NB, June 2018.
- *The periodicity of the Coxeter transformation*, The XXI<sup>e</sup> Colloque panquébécois des étudiants de l'Institut des Sciences mathématiques (ISM), Université de Sherbrooke, QC, May 2018.
- *The Coxeter transformation on cominuscule posets*, Séminaire de combinatoire, Université du Québec à Montréal, LaCIM, QC, February 2018.
- *The Coxeter transformation on cominuscule posets*, Department seminar, Mimar Sinan University, Istanbul, December 2017.
- *The Coxeter transformation on grid posets*, Department seminar, Istanbul Technical University, Istanbul, December 2017.
- *Cluster Monomials in Web Basis*, Algebra seminar, University of Sherbrooke, QC, November 2017.

- *Cluster Monomials in Web Basis*, Cluster algebras seminar, University of Connecticut, CT, November 2017.
- *Coxeter transformation on cominuscule posets*, Cluster algebras seminar, University of Connecticut, CT, October 2017.
- *Coxeter transformation on cominuscule posets*, Combinatoric seminar, University of Minnesota, MN, September 2017.
- *Auslander-Reiten translation on cominuscule posets*, Advances in Representation Theory of Algebras VI: Geometry and Homology (ARTA), Luminy, September 2017.
- *Periodic behavior of Auslander-Reiten translation*, The Mathematical Congress of the Americas (MCA), Montreal, QC, July 2017.
- *On the combinatorics of gentle algebras*, XXVIIIth Meeting on Representation Theory of Algebras, Sherbrooke, QC, September 2016.
- *Coxeter transformation of the poset of order ideals in a grid*, International Conference on Representations of Algebras, Syracuse, NY August 2016.
- *Cluster Algebras*, Graduate Seminar, University of New Brunswick, NB, April 2015.
- *Two dimensional Yetter-Drinfeld modules over  $U_q(sl_2)$  are trivial*, Hopf Algebras in (Co)Action workshop, NB, June 2014.
- *Monomial ideals of path algebras*, Research Seminars, University of New Brunswick, NB, March 2014.

**SELECTED  
RECENT  
CONFERENCES &  
WORKSHOPS**

- Representation Theory of Quivers and Finite-Dimensional Algebras, Oberwolfach, February 2026.
- Beyond Permutahedra and Associahedra, CIRM, December 2025.
- Frieze patterns in algebra, combinatorics and geometry, CIRM, May 2025.
- Women in Noncommutative Algebra and Representation Theory 4 (WINART4), BIRS, Calgary, March 2025.
- Perspective on Markoff Numbers, BIRS, Calgary, January 2025.
- Lattice Theory, Banff International Research Station (BIRS), Calgary, January 2025.
- New developments in representation theory of algebras: Algebraic, combinatorial and geometric aspects, Okinawa Institute of Science and Technology (OIST), November 2024.
- Clusters and their Applications in the North (CLAN), University of Central Lancashire, Preston in June 2024 & University of Glasgow in February 2024.
- Current Trends in Representation Theory, Cluster Algebras and Geometry, Centre International de Rencontres Mathématiques (CIRM), Luminy, November 2023.
- Arbeitsgemeinschaft: Cluster Algebras, Oberwolfach, October 2023.
- Functor Categories, Model Theory, and Constructive Category Theory, University of Málaga, July 2023.

- Advances in Representation Theory of Algebras IX, Queen's University, Kingston, June 2023.
- ARTIN meeting, the University of Manchester, March 2022.
- Representation Theory and Geometry, Queen's University - RMC, February 2022 (online).
- Combinatorial Algebra meets Algebraic Combinatorics, 19th Annual Meeting, The Fields Institute, January 2022 (online).
- New developments in representation theory arising from cluster algebras, Isaac Newton Institute, September 2021 (online).
- Flash Talks in Representation Theory, NTNU, January 2021 & 2023 (online), 2025.
- Meeting on Representation Theory of Algebras – Corona Edition, Sherbrooke, QC, September 2020 (online).
- Dimers in Combinatorics and Cluster Algebras, University of Michigan, August, 2020 (online).

## **SKILLS**

*Languages:* Turkish (native), English (fluent), French (intermediate).

*Software:* SAGE, GAP, PYTHON.

*Art:* Painting, Photography.