

Yamil Felipe Sagurie Sagurie

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Research interests: representation theory of Hecke algebras, algebraic combinatorics and Kazhdan–Lusztig theory; affine Weyl groups, the spherical Hecke algebra and its pre-canonical bases, positivity and q -analogues of weight multiplicities.

Education

- 2020 – 2025 ■ **Ph.D. in Mathematics**, Universidad de Talca, Chile. Defended on June 26, 2025.
Thesis: *Positivity of pre-canonical bases in type A*. Advisor: Dr. David Plaza.
- 2024 ■ **Research stay**, LAMFA, Université de Picardie Jules Verne, Amiens, France (April 13 – July 14, 2024).
Host: Dr. Daniel Juteau.
- 2018 – 2020 ■ **M.Sc. in Mathematics**, Universidad de Talca, Chile.
Thesis: *Closed formulas for R -polynomials of Kazhdan–Lusztig of type A*.
- 2013 – 2018 ■ **Teaching degree in Mathematics** (Profesor de Matemáticas), Universidad del Bío-Bío, Chile.
Thesis: *Elliptic curves and applications*.
- 2016 ■ **Diploma in Collaborative Work**, Universidad del Bío-Bío, Chile.

Positions

- 2020 – present ■ **Part-time Lecturer**, Institute of Mathematics, Universidad de Talca, Chile.
Undergraduate courses for Engineering and other programs (see Teaching); course co-ordinator of Linear Algebra and Ordinary Differential Equations (2026).

Preprints

- 1 ■ D. Plaza and Y. Sagurie, *Positivity of pre-canonical bases for spherical Hecke algebras*, 2026. arXiv: 2608.07703.

Talks

- 2025 ■ **Positivity of pre-canonical bases in type A**
Ph.D. thesis defense, Universidad de Talca (June 26, 2025).
- **Kazhdan–Lusztig polynomials from a historical perspective**
Non-Degenerate Seminar (Ph.D. seminar), Institute of Mathematics, Universidad de Talca.
- 2024 ■ **Positivity for pre-canonical bases in affine Hecke algebras of type A**
XVII Coloquio Latinoamericano de Álgebra (CLA).
- **Kazhdan–Lusztig polynomials and positivity for pre-canonical bases**
Groupes, Algèbre et Topologie (GATo), LAMFA, Université de Picardie Jules Verne.
- **Kazhdan–Lusztig polynomials on affine Hecke algebras**
Séminaire doctorant, LAMFA, Université de Picardie Jules Verne.
- **Algorithms for Kazhdan–Lusztig polynomials**
Winter School, Institute of Mathematics, Universidad de Talca.
- 2023 ■ **Spherical Hecke algebra**
Non-Degenerate Seminar (Ph.D. seminar), Institute of Mathematics, Universidad de Talca.

Funding, Awards and Service

- 2024  **ANID complementary benefits** for a research stay abroad (LAMFA, France).
- 2020 – 2024  **ANID National Doctoral Scholarship** (Beca Doctorado Nacional), No. 21201961.
- 2024 – 2026  Partially supported by **ANID–FONDECYT Regular Grant 1240199** (PI: D. Plaza).
- 2024  **Co-organizer**, II Encuentro Nacional de Estudiantes en Matemáticas (ENEMAT), Universidad de Talca.
- 2018  **Premio al Desarrollo Estudiantil** (student development award), Universidad del Bío-Bío.

Software and Outreach

- 2026  **Interactive research animations**: step-by-step, manipulable web animations of the alcove arrangement, the Kazhdan–Lusztig basis, the spherical and antispherical modules and the pre-canonical bases of type A.
<https://yamilsagurie.com/#animations>
-  **Digital courses** for the Plan26 institutional platform, Universidad de Talca: Mathematics II, Mathematics III and Algebra.
- 2021 – 2025  **Motivational talks** for incoming students, Universidad del Bío-Bío (every March).

Teaching

- 2024 – 2026  **Linear Algebra**, Engineering (course coordinator, 2026).
- 2026  **Ordinary Differential Equations**, Engineering (course coordinator).
- 2025 – 2026  **Introduction to Mathematics and Calculus in Several Variables**, Engineering.
- 2025  **Calculus I, II and III and Algebra** (logic, series, complex numbers), Engineering.
- 2024  **Introduction to Mathematics**, Nursing.
- 2023  **Geometry III** (vector, solid and non-Euclidean geometry), Mathematics Teacher Education.
- 2021 – 2023  **Mathematics**, Business and Economics.

Skills

- Languages  Spanish (native), English (B2), French (A1), Italian (A1).
- Software  SageMath, Python, $\text{\LaTeX}$, JavaScript (interactive web animations).