# Lien **CARTAYA**

## PhD Candidate in Mathematics

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Mathematics PhD candidate specializing in representation theory, invariant theory, and non-commutative algebra. Interested in reflection groups, rational Cherednik algebras, symplectic reflection algebras, quotient singularities, diagonal coinvariant rings, and computational algebra.

## Education

2024 - 2028 | **PhD Candidate in Mathematics**, Universidad de Talca, Chile
Working on zero-fiber rings associated with quaternionic reflection groups
Using tools from representation theory, invariant theory, symplectic reflection algebras, and computational algebra
Advisor: Stephen Griffeth
Python Macaulay2 LaTeX

2022 - 2024 | **Master in Mathematics**, Universidad de Talca, Chile
Thesis: *Non-commutative deformations of quotient singularities*
Studied computational aspects of invariant theory and symplectic reflection algebras
Advisor: Stephen Griffeth
Python LaTeX

2016 - 2020 | **Degree in Mathematics**, Universidad de La Habana, Cuba
Thesis: *Study on high-simensional algorithms for the reduction of STRESS in Multidimentional Scaling*
Advisor: Elina Miret Barroso
Macaulay2 LaTeX

## Publications

2025 **Zero fibers of quaternionic quotient singularities**. *Revista Matemática Iberoamericana* 41, no. 3, 1461–1487. Joint work with S. Griffeth. DOI: 10.4171/RMI/1528.

## Manuscripts in Preparation

**Zero fiber rings for rank 2 quaternionic reflection groups**. In preparation.

**Wonderful models of subspace arrangements for division rings**. Joint work with S. Griffeth and D. Guevara. In preparation.

## Selected Presentations

Sep. 2026 **What zero remember?** Next Gen Session, 13th Heidelberg Laureate Forum, Heidelberg, Germany.

Aug. 2026 **Zero fiber rings for rank 2 quaternionic reflection groups**. XXV Latin American Congress of Algebra, Lima, Peru.

Jul. 2026 **A Coxeter-type bound for zero-fiber rings of quaternionic quotient singularities**. CIME School on Algebraic and geometric combinatorics: Coxeter group theory and representation theory, Cetraro, Italy.

Apr. 2026 **On bounds for the degree of the zero fiber of rank-2 quaternionic reflection groups**. XXXVIII Jornada de Matemática de la Zona Sur, Universidad del Bío-Bío, Concepción, Chile.

Aug. 2025 **The diagonal coinvariant ring for quaternionic reflection groups**. X Encuentro Nacional de Algebra – EMALCA Argentina, Córdoba, Argentina.

Apr. 2025 **About the diagonal coinvariant ring for quaternionic reflection groups**. XXXVII Jornada de Matemática de la Zona Sur, Universidad Católica del Maule, Talca, Chile.

Jul. 2024 **Zero fiber of quotient singularities**. XXIV Coloquio Latinoamericano de Algebra, Santiago de Chile, Chile.

Jul. 2021 **Application of multidimensional scaling to SARS-CoV-2 patients treated with Interferon**. Poster, I Festival Nacional de Matemática y Computación, La Habana, Cuba.

Mar. 2020 **Study and implementation of algorithms for high-dimensional multidimensional scaling**. IX Encuentro de Matemática Numérica y Optimización, Cuba–Mexico, La Habana, Cuba.

## Awards & Grants

2026 **Selected young researcher**, 13th Heidelberg Laureate Forum, Heidelberg, Germany.
2026 **Operational expenses for research**, ANID, Chile.
2024 - 2028 **ANID Beca de Doctorado Nacional**, Chile.

## Organization of Seminars and Conferences

Jan. 2026 Member of the Organizing Committee of the 2026 Summer School for Undergraduates in Mathematics, Instituto de Matemáticas, Universidad de Talca, Chile.

## Teaching Experience

Sep. 2026 - **Mathematics Tutor**, IDI Tutoring Academy. Online mathematics tutoring in English.

Mar. 2026 **Instructor**, Preparatory Mathematics course for engineering degrees, Universidad de Talca, Chile. Duration: one week.
2025 **Lecturer**, Universidad de Talca. Precalculus and Calculus for Commercial Engineering.
2022 - 2025 **Teaching Assistant**, Universidad de Talca. Statistics and Probability, Calculus, Linear Algebra, and Ordinary Differential Equations.
2017 - 2022 **Teaching Assistant**, Universidad de La Habana. Calculus, Linear Algebra, and Real Analysis.
Jan. 2023 **Teaching Assistant**, Summer School on finite subgroups of $SL_2$ by S. Griffeth, Universidad de Talca, Chile.

## Outreach

Jun. 2026 **Instructor, Club de Matemáticas Yachay Tech**. Minicourse *An introduction to Gröbner bases*. Notes and videos, Universidad Yachay Tech, Ecuador.
Jan. 2026 **Instructor**, short course *Invisible Patterns: Changing without changing*, Campamento Hannah, Instituto de Matemáticas, Universidad de Talca, Chile. Mathematics outreach program for female high school students.

## Other Professional Experience

2024 - 2026 **Social Media Assistant**, Institute of Mathematics, Universidad de Talca, Chile
Part-time academic communication and support for institutional outreach

2021 **Data Scientist**, Mandao, La Habana, Cuba
Part-time data analysis work using spreadsheets, Python, and web analytics tools
Python Excel Google Analytics

## Schools, Workshops, and Conferences Attended

Sep. 2026 IA en la práctica matemática, Pontificia Universidad Católica de Chile, Santiago, Chile.
Jul. 2026 Algebraic Combinatorics and Finite Groups IV, Cetraro, Italy.
Jun.–Jul. 2026 CIME School: Algebraic and geometric combinatorics: Coxeter group theory and representation theory, Cetraro, Italy.
Mar. 2023 CIMPA School *Crossroads of Geometry, Representation Theory and Higher Structures*, Puerto Madryn, Argentina.

## Languages

Spanish (Native), English (B2), Italian (A1).

## Interests

Camping, organization of events, scientific outreach.

## Referees

**Prof. Stephen Griffeth**. Institute of Mathematics, Universidad de Talca, Chile. sgriffeth@utalca.cl
**Prof. María Ofelia Ronco**. Universidad de Talca, Chile. mronco@utalca.cl
**Prof. Nicolás Libedinsky**. Department of Mathematics, Universidad de Chile, Chile. nlibedinsky@gmail.com