

Employment:

2026– **University of California, Los Angeles**,
Math Fellow.

Education:

2022–2026 **Pontificia Universidad Católica de Chile**,
Ph.D in Mathematics.

2020–2021 **Pontificia Universidad Católica de Chile**,
M.S in Mathematics.

2016–2019 **Universidad de los Andes (Colombia)**,
B.S in Mathematics.

Research Interests:

- **General:** Algebraic geometry
- **Specific:** Algebraic surfaces, Birational geometry, Deformation theory, Cox Rings.

Preprints/Publications:

Orbifold Degenerations of Hirzebruch Surfaces, arXiv:2608.27652.

Computing Cox Rings via Kawamata-Morrison, with Tomoki Oda and José Yañez, arXiv:2607.13032, Submitted.

Degenerations of Cluster Type Varieties, with Joaquín Moraga, arXiv:2511.14959, Submitted.

Wahl Singularities in Degenerations of del Pezzo Surfaces, with Giancarlo Urzúa, arXiv:2504.19929, Submitted.

The Birational Geometry of Markov Numbers, with Giancarlo Urzúa, Mosc. Math. J. 25 (2025), no.2, 197–248, arXiv:2310.17957.

Accepted and Invited Talks:

- Jul 2026 **Orbifold Degenerations of Hirzebruch Surfaces**, *Junior Algebraic Geometry Workshop 2026*, University of California, Los Angeles.
- Feb 2026 **Degenerations of Smooth Rational Surfaces**, *Algebraic Geometry Seminar*, University of California, Riverside.
- Jan 2026 **Degenerations of Smooth Rational Surfaces**, *Algebra Seminar*, University of California, Los Angeles.
- Jan 2026 **Degenerations of Weighted Projective Planes**, *Morning Algebraic Geometry Seminar*, University of California, Los Angeles.
- Dec 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *Algebraic Varieties and their Singularities*, Universidad de Talca.
- Nov 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *Algebraic Geometry Seminar (online)*, Ohio State University.
- Nov 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *Birational Geometry Seminar (online)*, University of California, Los Angeles.
- Nov 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *UC Riverside Algebraic Geometry Seminar (online)*, University of California, Riverside.
- Oct 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *Santiago Algebra and Number Theory Seminar*.

- Jun 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *Junior Algebraic Geometry Workshop*, University of California, Los Angeles.
- Apr 2025 **Wahl Singularities in Degenerations of del Pezzo surfaces**, *XXXVII Jornada Matemática de la Zona Sur*.
- Dec 2024 **The Birational Geometry of Markov Numbers**, *Annual Meeting of the Chilean Mathematical Society*.
- Apr 2024 **The Birational Geometry of Markov Numbers**, *XXXVI Jornada Matemática de la Zona Sur*.
- Nov 2023 **The Birational Geometry of Markov Numbers**, *Algebraic Geometry Seminar (online)*, Tata Institute of Fundamental Research.

Poster Presentations:

- Dec 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *Iberoamerican Congress on Singularities*, Valparaiso, Chile.
- Jul 2025 **Wahl Singularities in Degenerations of del Pezzo Surfaces**, *2025 Summer Research Institute in Algebraic Geometry*, Colorado State University, Fort Collins.

Seminar Presentations:

- Winter 2026 **Cox Sheaves and Cox Rings**, *Algebra Participating Seminar*, University of California, Los Angeles.
- Fall 2025 **Degenerations of Weighted Projective Planes**, *Graduate Students Seminar*, Universidad de Talca.
- Fall 2025 **Cluster Geometry I,II**, *Algebraic Geometry Seminar*, PUC Chile.
- Summer 2025 **Discrete Geometry of Degenerations of del Pezzo Surfaces**, *Algebraic Geometry Seminar*, PUC Chile.
- Spring 2025 **Hacking Exceptional Collections of Vector Bundles**, *Algebraic Geometry Seminar*, PUC Chile.
- Spring 2025 **MMP and degenerations of Hirzebruch Surfaces**, *Algebraic Geometry Seminar*, PUC Chile.
- Summer 2024 **Degenerations of Surfaces and Markov numbers**, *Graduate Students Seminar*, PUC Chile.
- Spring 2024 **K-Stability and Singularities of the MMP**, *Algebraic Geometry Seminar*, PUC Chile.
- Spring 2024 **A Conjecture of Markov Numbers and Limits of Plane Curves**, *Algebraic Geometry Seminar*, PUC Chile.
- Spring 2023 **Explicit MMP in Singular Surfaces and Threefolds I,II,III**, *Algebraic Geometry Seminar: Birational Geometry of Singular Surfaces and Threefolds*, PUC Chile.
- Spring 2023 **Extremal Contractions and the MMP**, *Algebraic Geometry Seminar: Birational Geometry of Singular Surfaces and Threefolds*, PUC Chile.
- Spring 2023 **Cone Theorem and Applications**, *Algebraic Geometry Seminar: Birational Geometry of Singular Surfaces and Threefolds*, PUC Chile.
- Fall 2022 **Lee-Park Recipes for Building Surfaces of General Type**, *Graduate Students Seminar*, PUC Chile.
- Spring 2022 **Classification of Smooth Projective Surfaces I,II**, *Algebraic Geometry Baby Seminar*, PUC Chile.
- Fall 2020 **Fans and Toric Varieties II**, *Algebraic Geometry Baby Seminar: Toric Varieties*, PUC Chile.
- Fall 2020 **Affine Toric Varieties and Semigroups I,II**, *Algebraic Geometry Baby Seminar: Toric Varieties*, PUC Chile.
- Spring 2019 **The Derived Category of Coherent Sheaves over Projective Spaces**, *Undergraduate thesis dissertation*, Universidad de los Andes.
- Spring 2019 **The Birkhoff-Grothendieck Theorem**, *Graduate Students Seminar*, Universidad de los Andes.

Teaching Experience:

- Fall 2025 **Teaching Assistant**, *Graduate Algebraic Geometry*, Prof: Yulieth Prieto, PUC Chile.
- Spring 2024 **Teaching Assistant**, *Graduate Topology and Geometry of Manifolds*, Prof: Mauricio Bustamante, PUC Chile.
- Spring 2023 **Teaching Assistant**, *Graduate Topology and Geometry of Manifolds*, Prof: Mauricio Bustamante, PUC Chile.

Spring 2021 **Instructor**, *Precalculus*, PUC Chile.
Fall 2020 **Teaching Assistant**, *Quantitative Reasoning*, PUC Chile.
Spring 2019 **Teaching Assistant**, *Linear Algebra 1*, Universidad de los Andes.
Fall 2018 **Teaching Assistant**, *Integral Calculus*, Universidad de los Andes.

Research Stays:

12/30/2025–02/04/2026 **University of California, Los Angeles**, *Visiting Prof Joaquín Moraga*.
06/23/2025–07/19/2025 **University of California, Los Angeles**, *Visiting Prof Joaquín Moraga*.

Conferences Attended:

Jul 2026 **Junior Algebraic Geometry Workshop**, *Los Angeles, USA*.
Dec 2025 **Iberoamerican Congress on Singularities**, *Valparaíso, Chile*.
Dec 2025 **Algebraic Varieties and their Singularities**, *Talca, Chile*.
Jul 2025 **Summer Research Institute in Algebraic Geometry**, *Fort Collins, USA*.
Jul 2025 **Bootcamp: Summer Research Institute in Algebraic Geometry**, *Fort Collins, USA*.
Jun 2025 **Junior Algebraic Geometry Workshop**, *Los Angeles, USA*.
Apr 2025 **XXXVII Jornada Matemática de la Zona Sur**, *Talca, Chile*.
Jan 2025 **Workshop Agrupando Equipos de Geometría Algebraica: Agrega4**, *La Serena, Chile*.
Dec 2024 **Annual Meeting of the Chilean Mathematical Society (Somachi)**, *Valdivia, Chile*.
Aug 2024 **VII Latin American and Caribbean Congress of Mathematics (CLAM)**, *João Pessoa, Brazil*.
Aug 2024 **(V ELGA) Latinoamerican School of Algebraic Geometry**, *Cabo Frio, Brazil*.
Jul 2024 **Colombian Encounter of Tropical and Non-archimedean Geometry**, *Bogotá, Colombia*.
Jul 2024 **Latin American Algebra Colloquium**, *Santiago, Chile*.
Apr 2024 **XXXVI Jornada Matemática de la Zona Sur**, *Temuco, Chile*.
Dec 2023 **Annual Meeting of the Chilean Mathematical Society (Somachi)**, *Santiago, Chile*.
Dec 2023 **8th Iberoamerican Congress on Geometry**, *Pucón, Chile*.
Dec 2022 **Workshop Geometry at the Frontier 3 1/2**, *Pucón, Chile*.

Scholarships:

2022-2026 **Chilean government scholarship for doctoral studies (ANID)**.
2020-2021 **Beca de Magister Facultad de Matemática**, *PUC Chile*, Covers 90% of masters degree tuition and provides a monthly stipend.

Organization:

Fall 2024 **Graduate Students Seminar**, *Co-organizers: Jhon Alexander Rodriguez and Marcos Canedo*, PUC Chile.
Summer 2024 **Student Tutoring Session: Minicourse 2**, *Co-organizer: Marcos Canedo*, V Latin American School of Algebraic Geometry (V ELGA).
Spring 2023 **Birational Geometry of Singular Surfaces and Threefolds**, *Co-organizer: Marcos Canedo*, PUC Chile.
Fall 2020 **Junior Algebraic Geometry Seminar**, *Co-organizer: Diana Torres*, PUC Chile.

Languages:

Spanish Native speaker.
English Fluent.

Portuguese Intermediate.

Computer skills:

Languages: Python, Java, familiarity with SAGE, MAGMA and Macaulay2.
Some useful software in algebraic geometry: Nres.py, WdPc.py