

CURRICULUM VITA

Joaquín Moraga

Born: March 5th, 1994, Concepción, Chile.

Nationality: Chilean.

Address: Department of Mathematics, Fine Hall.

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Employment:

Princeton University

Instructor in Mathematics.

September 2019 - June 2022

Education:

University of Utah

Ph.D. Mathematics.

Advisor: Christopher Hacon.

August 2015- May 2019

Universidad de Concepción

M.S. Mathematics.

Advisors: Antonio Laface and Alvaro Liendo.

March 2014- June 2015

Universidad de Concepción

B.S. Mathematics.

March 2012- November 2013

Research:

- (1) **Linear systems on the blow-up of $(\mathbb{P}^1)^n$** (with A. Laface). Linear Algebra and its Applications, Volume 492 (2016), Pages 52-67.
- (2) **On a notion of toric special linear systems.** Journal of Pure and Applied Algebra, Volume 223, Issue 8, August 2019, Pages 3225-3237.
- (3) **On the topology of rational T-varieties of complexity one** (with A. Laface and A. Liendo). Moscow Mathematical Journal. 20 (2020), no. 2, 405-404.

- (4) **Bounding singular surfaces via Chern numbers.** *Mathematische Zeitschrift.* 295 (2020), no. 3-4, 1597-1614.
- (5) **The fundamental group of a log terminal T-variety** (with A. Laface and A. Liendo). *European Journal of Mathematics*, September 2019, Volume 5, Issue 3, pp 937–957.
- (6) **Termination of pseudo-effective 4-fold flips.** Submitted.
- (7) **On weak Zariski decompositions and termination of flips** (with C. Hacon). To appear in *Mathematical Research Letters*.
- (8) **Cohen-Macaulay Du Bois singularities with a torus action of complexity one** (with A. Laface and A. Liendo). Submitted.
- (9) **Regularity of structure sheaves of varieties with isolated singularities** (with J. Park and L. Song). *Communications in Contemporary Mathematics.* (2020) 2050039 (25 pages).
- (10) **On minimal log discrepancies and Kollár components.** To appear in *Manuscripta Mathematica*.
- (11) **Strong (δ, n) -complements for semistable morphisms** (with S. Filipazzi). *Documenta Mathematica.* 25, 1953-1996 (2020).
- (12) **A boundedness theorem for cone singularities.** To appear in *Proceedings of the Edinburgh Mathematical Society*.
- (13) **Bounded deformations of (ϵ, δ) -log canonical singularities.** (with J. Han and J. Liu). *Journal of Mathematical Sciences (Tokyo).* Vol. 27 (2020), No. 1, Page 1-28.
- (14) **Log canonical 3-fold complements** (with S. Filipazzi and Y. Xu). Submitted.
- (15) **Extracting non-canonical places.** *Advances in Mathematics.* 375 (2020) 107415, 12pp..
- (16) **Fano type surfaces with large cyclic automorphisms.** Submitted.
- (17) **The Jordan property for local fundamental groups.** (with Lukas Braun, Stefano Filipazzi and Roberto Svaldi). To appear in *Geometry and Topology*.
- (18) **Special termination for log canonical pairs.** (with Vladimir Lazić and Nikolaos Tsakanikas). Submitted.
- (19) **Kawamata log terminal singularities of full rank.** ArXiv:2007.10322. Submitted.
- (20) **Small quotient minimal log discrepancies.** To appear in *Michigan Mathematical Journal*.

- (21) **Maximal log Fano manifolds are generalized Bott towers.** (with Konstantin Loginov). Submitted.
- (22) **Iteration of Cox rings of klt singularities.** (with Lukas Braun). Submitted.

Distinctions and Awards:

As high-school student:

Universidad de Concepción Mathematical Olympiad. Several prizes: 1 Honorable mention, 1 silver medal, and 3 gold medals.

Chilean Mathematical Olympiad. Several prizes: 1 Honorable mention, 1 bronze medal, 1 silver medal, and 1 gold medal.

Participation in the XX Mathematical Olympiad of the Southern Cone, Brazil 2010.

As undergraduate student:

Second place in the “Youth mathematical talent competition” held by the school of engineers of Chile 2013.
Premio Universidad de Concepción 2014 (highest distinction of the university).

As master student:

National scholarship for master students 2014.

Highest distinction from the Chilean Mathematical Society for master students 2014.

As Ph.D. student:

Rushing Graduate Scholarship Award, Summer 2018.

As a postdoctoral researcher:

Teaching Award, Princeton University, Spring 2020: In recognition of outstanding remote instruction and service.

Invited Talks:

Spring 2014: Jornada Matemática de la Zona Sur, Chile, Sesión de Geometría.

Spring 2014: LXXXIII encuentro anual de la sociedad chilena de matemática, Sesión de Geometría.

Spring 2015: Pontificia Universidad Católica de Chile, Seminario de Geometría Algebraica.

Fall 2015: Graduate Student Advisory Committee at the University of Utah.

Summer 2016: Mathematical Colloquium at Universidad de Concepción.

Fall 2016: Algebraic Geometry Students Seminar at the University of Utah.

Spring 2017: Mathematical Colloquium at Universidad de Concepción.

Spring 2017: Algebraic Geometry Students Seminar at the University of Utah.

Fall 2017: Algebraic Geometry Students Seminar at the University of Utah.

Spring 2018: University of California, Riverside. Algebraic Geometry Seminar.

Fall 2018: Algebraic Geometry Students Seminar at the University of Utah.

Fall 2018: University of Utah, Algebraic Geometry seminar.

Fall 2018: University of California, San Diego. Algebraic Geometry Seminar.

Fall 2018: AMS sectional meeting, Birational Geometry session, Arkansas.

Fall 2018: University of Michigan, Algebraic Geometry seminar.
Spring 2019: Cambridge University, Algebraic Geometry seminar.
Summer 2019: MIPT, Laboratory of Homological Algebra, Moscow.
Fall 2019: John Hopkins University, Algebraic Geometry Seminar.
Fall 2019: Princeton University, Algebraic Geometry Seminar.
Spring 2020: UCLA, Algebraic Geometry Seminar.
Spring 2020: Columbia University, "Talk till your stuck" seminar.
Spring 2020: Rutgers University, Algebraic geometry seminar.
Spring 2020: Moscow Algebraic Geometry Zoom Seminar.
Spring 2020: Coronags Zoom seminar: "The Minimal Model Program".
Spring 2020: Yale Algebraic geometry Zom seminar.
Fall 2020: Zoom Algebraic Geometry Seminar.
Fall 2020: Michigan State University, Algebraic Geometry Seminar.
Spring 2021: Forschungsseminar - Algebra/Algebraische Geometrie.
Spring 2021: Singularities and Topology team of the Department of Mathematics of UFC.
Spring 2021: Algebraic Geometry Seminar, Kansas University.

Teaching:

Universidad de Concepción:

Spring 2012: Teaching assistant, Introduction to Mathematics.
Spring 2012: Teaching assistant, Vector calculus.
Fall 2012: Teaching assistant, Vector calculus.
Spring 2013: Teaching assistant, Vector calculus.
Fall 2013: Teaching assistant, Vector calculus.
Spring 2014: Teaching assistant, Vector calculus.
Fall 2014: Teaching assistant, Vector calculus.

Mathematical Olympiad Training:

Summer 2013: Instructor, Summer school of Mathematics, Training for the chilean mathematical olympiad.
Summer 2014: Instructor, Summer school of Mathematics, Training for the chilean mathematical olympiad.

University of Utah:

Fall 2015: Teaching assistant, MATH 1311, Accelerated engineering calculus.
Spring 2016: Teaching assistant, MATH 1321, Accelerated engineering calculus.
Fall 2016: Instructor, MATH 1030, Introduction to quantitative reasoning.
Fall 2017: Instructor, MATH 1220, Calculus 2.
Fall 2018: Instructor, MATH 1210, Calculus 1.

Princeton University:

Fall 2019: Instructor, MAT201, Section C0A1, Multivariable Calculus.
Spring 2020: Instructor, MAT202, Section C0A1 and C0B2, Linear Algebra.
Fall 2020: Instructor, MAT201, Section
Spring 2021: Instructor, MAT202, Section C04A.

Professional Activities:**Students supervised:**

Daigo Ito, junior student at Princeton University, Summer Research Project 2020 on Deformation Theory. Paper title: “Algebraic Geometry of Flag Varieties”.

Seminars organized:

Spring 2020: CORONA Geometry Seminar (with S.Makarova and E.Elmanto).

Spring 2020: Princeton Algebraic Geometry preprint seminar.

Summer 2020: Princeton Algebraic Geometry preprint seminar.

Fall 2020: Princeton Algebraic Geometry Seminar (with C.Xu).

Fall 2020: Princeton Algebraic Geometry preprint seminar (with D.Villalobos Paz).

Spring 2021: Princeton Algebraic Geometry Seminar (with C.Xu).

Spring 2021: Princeton Algebraic Geometry preprint seminar (with D.Villalobos Paz).

Spring 2021: Minimal Model Program Learning Seminar. This seminar aims to train young graduate students on the techniques of the Minimal Model Program.

Refereed for journals:

European Journal of Mathematics, International Mathematics Research Notices, Journal of Algebra and Number Theory, Compositio Mathematica, International Journal of Mathematics, American Journal of Mathematics, and Springer Proceedings of Moscow-Shanghai-Pohang conference. Gave opinions on papers for *Inventiones Mathematicae*.

Reviewed for journals:

Zentralblatt MATH and Mathematical Reviews (AMS).