

# Nicolas Libedinsky

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## Employment/Education

- 2021-present Full professor, University of Chile.
- 2018-2021 Associate professor, University of Chile.
- 2012-2018 Assistant professor, University of Chile.
- 2010-2012 Von Humboldt postdoctoral fellow, Freiburg University.
- 2009-2010 Postdoctoral fellow, University Paris 7.
- 2008-2009 Postdoctoral fellow, University Paris 12.
- 2008 Ph.D. in Mathematics, University Paris 7. Advisor: Raphael Rouquier.
- 2003-2006 Magistère in Mathematics, École Normale Supérieure, Paris.
- 2000-2002 B.A. in Mathematics, University of Chile.

## Fields of Interest

(Higher, modular) Representation theory, diagrammatic category theory, (singular) Soergel bimodules. Recently, relations between representation theory and the following: Bridgeland stability conditions, algebraic combinatorics, and convex geometry.

## Papers and preprints

28. *Soohak: A Mathematician-Curated Benchmark for Evaluating Research-level Math Capabilities of LLMs* (with Guijin Son, Seungone Kim, and others), arXiv preprint.
27. *Bruhat intervals that are large hypercubes* (with AlphaEvolve, J. Ellenberg, D. Plaza, José Simental and G. Williamson), arXiv preprint.
26. *Shape and class of Bruhat intervals* (with G. Burrull and R. Villegas), arXiv preprint.
25. *Paper BOAT* (with D. de la Fuente, F. Castillo and D. Plaza), arXiv preprint.
24. *The atomic Leibniz rule* (with B. Elias, H. Ko and L. Patimo), **Rev. Mat. Iberoam.** 42 (2026), no. 1, 187–228.
23. *On reduced expressions for core double cosets* (with B. Elias, H. Ko and L. Patimo), **Math. Res. Lett.** 32 (2025), no. 6, 1845–1876.

22. *Singular Light Leaves* (with B. Elias, H. Ko and L. Patimo), published online in **J. Eur. Math. Soc.** (2025).
21. *On the size of Bruhat intervals* (with F. Castillo, D. de la Fuente and D. Plaza), **Adv. Math.** 499 (2026), Paper No. 111048.
20. *Subexpressions and the Bruhat order for double cosets* (with B. Elias, H. Ko and L. Patimo), arXiv preprint arXiv:2307.15726.
19. *Demazure operators for double cosets* (with B. Elias, H. Ko and L. Patimo), **J. Pure Appl. Algebra** 230 (2026), no. 3, Paper No. 108207.
18. *On the size of Bruhat intervals* (with F. Castillo, D. de la Fuente and D. Plaza), **Sémin. Lothar. Comb.** 91B, Article 11 (2024)
17. *On the affine Hecke category* (with L. Patimo), **Selecta Math.** 29 (2023), no. 4, Paper No. 64.
16. *Combinatorial invariance conjecture for  $\tilde{A}_2$*  (with G. Burrull and D. Plaza), **IMRN** 10 (2023) 8903–8933.
15. *Introsurvey of representation theory*, **J. Indian Inst. Sci.** 102 (2022) 907–946.
14. *Pre-canonical bases on affine Hecke algebras* (with L. Patimo and D. Plaza), **Adv. Math.** 399 (2022).
13. *The Anti-Spherical category* (with G. Williamson), **Adv. Math.** 405 (2022).
12. *Kazhdan-Lusztig polynomials and subexpressions* (with G. Williamson) **J. Algebra** 568 (2021) 181–192.
11. *Blob algebra approach to modular representation theory* (with D. Plaza), **Proc. Lond. Math. Soc.** 121 (2020) 656–701.
10.  *$p$ -Jones-Wenzl idempotent* (with G. Burrull and P. Sentinelli) **Adv. Math.** 352 (2019) 246–264.
9. *Gentle Introduction to Soergel bimodules I*, **Sao Paulo J. of Math. Sci.** 13 (2019) 499–538.
8. *A non-perverse Soergel bimodule in type A* (with G. Williamson), **Comptes Rendus Mathématique** 355 (2017) 853–858.
7. *Indecomposable Soergel bimodules for Universal Coxeter groups* (with B. Elias, with an appendix by Ben Webster), **Trans. Amer. Math. Soc.** 369 (2017) 3883–3910.
6. *Light leaves and Lusztig’s conjecture* **Adv. Math.** 280 (2015) 772–807.
5. *Standard objects in 2-braid groups* (with G. Williamson) **Proc. Lond. Math. Soc.** 109 (2014) 1264–1280.
4. *New bases of some Hecke algebras via Soergel bimodules* **Adv. Math.** 228 (2011) 1043–1067.
3. *Presentation of right angled Soergel categories by generators and relations* **J. Pure Appl. Algebra** 214 (2010) 2265–2278.
2. *Équivalences entre conjectures de Soergel* **J. Algebra** 320 (2008) 2695–2705.
1. *Sur la catégorie des bimodules de Soergel* **J. Algebra** 320 (2008) 2675–2694.

## Selected administrative tasks

Since 2022. Evaluation commission of the Faculty of Sciences (in charge of deciding promotions to Assistant, Associate, and Full Professors).

2020-2022. Head of the Mathematics Department.

2019-2020. Auto evaluation commission of the Faculty of Sciences (in charge of deciding long-term policies for the Faculty).

2015-2017. Directory Board of the Chilean Mathematical Society.

## Selected outreach

More than 20 interviews in some mainstream media (El Mercurio, CNN Chile, radio BíoBío, radio Duna, radio La Clave, radio Pauta, radio Oasis, radio Universidad de Chile, TVN, Vía X, etc.)

Publication of the mathematical novel *La unidad de todas las cosas* by the publishing house Planeta in November 2019. Second edition in March 2020. Third edition (by publishing house Simplemente editores) September 2023. The translation of this novel to English will appear soon in Mosaic Press, a Canadian publishing house.

Organizer of the conference and several related activities celebrating the 50<sup>th</sup> Anniversary of the Faculty of Sciences, University of Chile, December 2015, featuring ten Nobel Prize and Fields Medal winners as speakers. Some 10.000 people attended this set of events.

Organizer of *Conversatorio de Juan*, a conversation about creativity between Anita Tijoux (nominated to several Grammy Awards), Gerard t'Hooft (winner of the Nobel prize in physics) and Humberto Maturana (winner of the National prize of Sciences), moderated by Soledad Onetto (journalist). Some 2.000 people attended the event.

## Postdocs

Aram Bingham Postdoc (2025-present)

Elizabeth Manosalva Postdoc (2023-2026)

Juan Camilo Arias Postdoc (2020-2021)

Karina Batistelli Postdoc (2019-2022)

Paolo Sentinelli Postdoc (2015-2018)

David Plaza Postdoc (2013-2016)

## Graduate students

Amaranta Valdés Ph.D. (2025-present)

Damian De La Fuente Ph.D. (2023-2025), supervision with Daniel Juteau.

Rodrigo Villegas Ph.D. (2019-2025)

Gaston Burrull Ph.D. (2018-2023), supervision with Geordie Williamson.

Gonzalo Jimenez Ph. D. (2017-2023)

Léo Quercioli MS (2025) exchange student (École Polytechnique).

Damian De La Fuente MS (2020-2022)

Sebastian Cea MS (2016-2017)

Gaston Burrull MS (2016-2018)

## Scientific committee

September-December 2025 (Providence, USA) Organizer of the semester “Categorification and Computation in Algebraic Combinatorics” in the Institute for Computational and Experimental Research in Mathematics (ICERM).

July 2020 (Montevideo, Uruguay) Jury of the UMALCA prize award recipients

July 2020 (Montevideo, Uruguay) *VI Latinamerican congress of Mathematicians*.

August 2019 (Mexico city, Mexico) *XXIII Latinamerican Colloquium of Algebra*.

July 2017 (Montreal, Canada) *Mathematical Congress of the Americas*. Session “Symmetry in Algebra, Topology, and Physics”.

March 2016 (Cordoba, Argentina) *Humboldt Kolleg Colloquium on Algebras and Representations - Quantum 2016*.

## Selected talks as invited speaker

August 2023 (Bath, England) London Mathematical Society Bath symposium on Geometric and Categorical Representation theory.

August 2023 (CALTECH, Pasadena, California) Algebra, geometry, and combinatorics of link homology.

March 2023 (Puerto Madryn, Argentina) Course in CIMPA school.

September 2022 (Oberwolfach, Germany) Character Theory and Categorification.

February 2020 (Queensland, Australia) New Connections in Representation Theory.

January 2020 (Marseille, France) Short course in IHP Winter School: Categorifications, Moduli Spaces and Representation Theory.

December 2018 (Cordoba, Argentina) Plenary talk in Quantum 60.

July 2018 (Stockholm, Sweden): Categorification and higher representation theory.

December 2016 (Valparaiso, Chile): Sub-plenary talk in the meeting between the Chilean Mathematical Society and the Argentinian Mathematical Union.

July 2017, (Quebec, Canada): Plenary talk in Representation Theory Day in Quebec City.

July 2017, (Montreal, Canada): Mathematical Congress of the Americas.

July 2016 (Buenos Aires, Argentina): Latinamerican algebra colloquium.

January 2015 (Pisa, Italy): Perspectives in Lie theory.

December 2014 (Lima, Peru): Mini-course in XX Latinamerican colloquium of algebra.

July 2014 (Lyon, France): Algebraic groups and representations.

January 2014 (Punta Arenas, Chile): Representation theory days in Patagonia.

November 2013 (Melbourne, Australia): Representation Theory in Geometry, Topology and Combinatorics.

September 2013 (Itacoatiara, Brazil): Plenary talk in Jornadas de Algebra em Amasonas.

December 2012 (Pucon, Chile): XIX Latinamerican colloquium of algebra.

December 2012 (Buenos Aires, Argentina): Mini-course in XXII Rioplatense congress of Algebra and Geometry.

August 2012 (Cordoba, Argentina): Latinamerican congress of mathematicians.

July 2010 (Oporto, Portugal): XIX Oporto Meeting on Geometry, Topology and Physics.

February 2009 (Paris, France): Colloque tournant, Groups geometry and representations.

November 2008 (Besancon, France): Annual algebra seminar of Besancon-Dijon.

## Projects

Fondecyt regular 1230247, 2023-2027.

Fondecyt regular 1200061, 2019-2023.

Fondecyt regular 1160152, 2015-2019.

Fondecyt iniciación 11121118, 2012-2015.

Anillo 10839, Associate researcher, 2015-2018.

Uredes (University of Chile multidisciplinary project) Director, 2013-2015.

## Organization of international conferences

Coorganizer of the conference "SUMA", Valparaíso, December 2016. meeting between the Chilean Mathematical Society and the Argentinian Mathematical Union. Over 300 mathematicians attended.

Organizer of the conference " $q^{\frac{1}{2}}$ ", University of Chile, December 2016. Two-day satellite conference of SUMA.

Coorganizer of the conference "First international congress in experimental approximations to social interaction", January 2015, Valparaíso, Chile. Multidisciplinary conference.

Coorganizer of the conference "Orderable groups", September 2014, Cajón del Maipo, Chile. Over fifty mathematicians attended.

## Professional activities

Trainer of the Chilean team for the International Mathematical Olympiads, 2000-2002.

Last updated: June 14, 2026