

# Gustavo Jasso

## Doctor of Philosophy

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### Biographical information

Full name Gustavo Jasso Ahuja  
Date of birth March 18, 1987  
Place of birth Guadalajara, Mexico  
Nationality Mexican

### Research interests

Primary Representation theory of quivers and algebras  
Secondary Homological algebra, homotopical algebra, higher category theory  
Cluster algebras and the related combinatorics

### Employment history

- Since 2024 **Universitätsprofessor für Algebra (W2)**, Faculty of Mathematics and Natural Sciences, University of Cologne, Cologne, Germany, Since 15.08.2024
- 2022–2024 **Universitetslektor (Senior Lecturer, permanent position)**, Centre for Mathematical Sciences, Faculty of Science, Lund University, Lund, Sweden, 01.03.2022–14.08.2024
- 2017–2022 **Akademischer Rat auf Zeit**, Mathematisches Institut, Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany, 01.10.2017–31.03.2022  
Contributor to Research Area A2 – Representations and symmetries in algebra and topology.  
Parental leave: 13.10.2021–13.12.2021.  
Unpaid leave: 01.03.2022–31.03.2022.
- 2014–2017 **Hausdorff Postdoc**, Hausdorff Center for Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn, Bonn, Germany, 01.10.2014–30.09.2017  
Mentor: Prof. Dr. Jan Schröer.

### Education history

- 2011–2014 **Doctor of Philosophy (Mathematical Science)**, Nagoya University, Nagoya, Japan, Graduation date: 29.09.2014  
Thesis title: On  $\tau$ -tilting theory and higher Auslander–Reiten theory.  
Advisor: Prof. Dr. Osamu Iyama.
- 2009–2011 **Master of Sciences degree in Mathematics (with honorific mention)**, Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico, GPA: 9.67/10  
Thesis title: El crecimiento de un álgebra de conglomerados de tipo tubular (The growth of a cluster algebra of tubular type).  
Advisors: Prof. Dr. Michael Barot (official) and Prof. Dr. Christof Geiss (unofficial second advisor).

- 2005–2010 **Undergraduate degree in mathematics (with honorific mention)**, Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico, GPA: 9.84/10  
 Thesis title: Álgebras de Lie de tipo afín extendido y formas cuadráticas (Extended affine Lie algebras and quadratic forms).  
 Advisor: Prof. Dr. Michael Barot.

## Grants and academical distinctions

- 2024 **Grant to recruit a foreign researcher for a postdoctoral position in Sweden**, Knut and Alice Wallenberg Foundation, 2.000.000 SEK, Declined.
- 2023–2026 **Research project grant within natural and engineering sciences**, Swedish Research Council (Vetenskapsrådet), 3.520.000 SEK  
 Project title: Higher structures in higher-dimensional homological algebra.
- 2022 **11th Award for Encouragement of Alumni and Students (Hida Award)**, Alumni Association of the Graduate School of Mathematics, Nagoya University, Nagoya, Japan  
 Awarded to graduates of the Department of Mathematics, Faculty of Science, Nagoya University, or graduates of the Graduate School of Mathematics, Nagoya University, who are recognised to have achieved outstanding results through their dissertations, articles published in academic journals, books, and other research achievements.
- 2018 **International Conference on Representations of Algebras (ICRA) 2018 Award**, ICRA 2018 Scientific and Award Committees, Prague, Czech Republic  
 Awarded at each session of ICRA for outstanding work by young mathematicians (not older than 35 years of age, except to allow for a broken career) in the field of Representations of Finite Dimensional Algebras. A second prize was awarded to Dr. Julian Külshammer (Uppsala).
- 2010 **Premio Sotero Prieto 2010**, Sociedad Matemática Mexicana, Tuxtla Gutiérrez, Mexico  
 Awarded to the best undergraduate thesis in mathematics presented at a Mexican institution between June 2009 and May 2010 (three theses were recognised).

## List of publications

### Preprints

- [1] **Jasso, G.**, Muro, F., The Derived Auslander–Iyama Correspondence, with an appendix by B. Keller, 2022, arXiv: 2208.14413.

### Book (in progress)

- [1] **Jasso, G.**, Differential graded categories, in progress (251 pages, approx. 50% progress). The book aims to introduce graduate students to the theory differential graded algebras and their derived categories, with a specific focus on its applications in representation theory of finite-dimensional algebras. The book tries to keep prerequisites to a minimum and therefore does not assume knowledge of the theory of triangulated categories (the relevant parts of which are introduced in the book).

### Research articles

- [15] **Jasso, G.**, On a theorem of B. Keller on Yoneda algebras of simple modules, Accepted for publication in C. R. Math. Acad. Sci. Paris, 2024, arXiv: 2402.14004.
- [14] **Jasso, G.**, Derived equivalences of upper-triangular ring spectra via lax limits, C. R. Math. Acad. Sci. Paris **362** (2024), 279–285.

- [13] Dyckerhoff, T., **Jasso, G.**, Lekili, Y., The symplectic geometry of higher Auslander algebras: symmetric products of disks, *Forum Math. Sigma* **9** (2021), Paper No. e10, 49, doi:10.1017/fms.2021.2.
- [12] Dyckerhoff, T., **Jasso, G.**, Walde, T., Generalised BGP reflection functors via the Grothendieck construction, *Int. Math. Res. Not. IMRN* (2021), **20**, 15733–15745, doi:10.1093/imrn/rnz194.
- [11] Dyckerhoff, T., **Jasso, G.**, Walde, T., Simplicial structures in higher Auslander–Reiten theory, *Adv. Math.* **355** (2019), 106762, doi:10.1016/j.aim.2019.106762.
- [10] **Jasso, G.**, Külshammer, J., Higher Nakayama algebras I: Construction, with an appendix by J. Külshammer and Ch. Psaroudakis and an appendix by S. Kvamme, *Adv. Math.* **351** (2019), 1139–1200, doi:10.1016/j.aim.2019.05.026.
- [9] **Jasso, G.**, Kvamme, S., An introduction to higher Auslander-Reiten theory, *Bull. Lond. Math. Soc.* **51** (2019), **1**, 1–24, doi:10.1112/blms.12204.
- [8] Demonet, L., Iyama, O., **Jasso, G.**,  $\tau$ -tilting finite algebras, bricks, and  $g$ -vectors, *Int. Math. Res. Not. IMRN* (2019), **3**, 852–892, doi:10.1093/imrn/rnx135.
- [7] Iyama, O., **Jasso, G.**, Higher Auslander correspondence for dualizing  $R$ -varieties, *Algebr. Represent. Theory* **20** (2017), **2**, 335–354, doi:10.1007/s10468-016-9645-0.
- [6] **Jasso, G.**,  $n$ -abelian and  $n$ -exact categories, *Math. Z.* **283** (2016), **3-4**, 703–759, doi:10.1007/s00209-016-1619-8.
- [5] Bergh, P. A., **Jasso, G.**, Thaulé, M., Higher  $n$ -angulations from local rings, *J. Lond. Math. Soc. (2)* **93** (2016), **1**, 123–142, doi:10.1112/jlms/jdv064.
- [4] **Jasso, G.**,  $\tau^2$ -stable tilting complexes over weighted projective lines, *Adv. Math.* **273** (2015), 1–31, doi:10.1016/j.aim.2014.12.018.
- [3] **Jasso, G.**, Reduction of  $\tau$ -tilting modules and torsion pairs, *Int. Math. Res. Not. IMRN* (2015), **16**, 7190–7237, doi:10.1093/imrn/rnu163.
- [2] **Jasso, G.**, The extended affine Lie algebra associated with a connected non-negative unit form, *J. Algebra* **409** (2014), 148–161, doi:10.1016/j.jalgebra.2014.03.029.
- [1] Barot, M., Geiss, C., **Jasso, G.**, Tubular cluster algebras II: Exponential growth, *J. Pure Appl. Algebra* **217** (2013), **10**, 1825–1837, doi:10.1016/j.jpaa.2012.12.012.

### Proceedings, extended abstracts & other writings

- [11] **Jasso, G.**, Universal Massey Products in Representation Theory of Algebras, in: Hochschild (co)homology and applications, Abstracts from the workshop held April 14–19, 2024, ed. by B. Keller, H. Krause, W. Lowen, and A. Solotar, Oberwolfach Rep. to appear.
- [10] **Jasso, G.**, Derived Endomorphism Algebras in Higher Auslander–Reiten Theory, in: Representation theory of quivers and finite-dimensional algebras, Abstracts from the workshop held January 12–18, 2023, ed. by C. Amiot, W. Crawley-Boevey, O. Iyama, and J. Schröer, Oberwolfach Rep. to appear, doi:10.14760/OWR-2023-7.

- [9] **Jasso, G.**, Keller, B., Muro, F., The Donovan–Wemyss Conjecture via the Derived Auslander–Iyama Correspondence, contribution to the proceedings of the Abel Symposium 2022: Triangulated categories in representation theory and beyond, 2023, arXiv: 2301.11593.
- [8] **Jasso, G.**, The symplectic geometry of higher Auslander algebras, an overview, in: Representation theory of quivers and finite dimensional algebras, Abstracts from the workshop held January 19–25, 2020, ed. by C. Amiot, W. Crawley-Boevey, O. Iyama, and H. Krause, **17**, Oberwolfach Rep. **1**, 2020, 143–230, doi:10.4171/owr/2020/3.
- [7] **Jasso, G.**, Higher Auslander algebras of type  $A$  and the higher Waldhausen  $S$ -constructions, in: Representation theory and beyond, ed. by J. Štíviček and J. Trlifaj, **758**, Contemp. Math. Amer. Math. Soc., Providence, RI, 2020, 249–265, doi:10.1090/conm/758/15238.
- [6] **Jasso, G.**, Külshammer, J., Nakayama-type phenomena in higher Auslander-Reiten theory, in: Representations of algebras, ed. by G. J. Leuschke, F. Frauke Bleher, R. Schiffler, and D. Zacharia, **705**, Contemp. Math. Amer. Math. Soc., Providence, RI, 2018, 79–98, doi:10.1090/conm/705/14191.
- [5] **Jasso, G.**, Spherical objects in higher Auslander–Reiten theory (joint work with J. Külshammer), in: Representation Theory of Quivers and Finite Dimensional Algebras, Abstracts from the workshop held February 19–25, 2017, ed. by W. Crawley-Boevey, O. Iyama, and H. Krause, **14**, Oberwolfach Rep. **1**, 2017, 591–681, doi:10.4171/OWR/2017/12.
- [4] **Jasso, G.**, Külshammer, J., The naive approach for constructing the derived category of a  $d$ -abelian category fails, arXiv:1604.03473 (2016), not intended for publication.
- [3] **Jasso, G.**, Reduction of  $\tau$ -tilting modules and torsion classes, in: Proceedings of the 16th Workshop on Representation Theory of Algebraic Groups and Quantum Groups, 2013, 157–160.
- [2] **Jasso, G.**, Cluster-tilted algebras of canonical type and quivers with potential, in: Proceedings of the 45th Symposium on Ring Theory and Representation Theory, 2012, 61–68.
- [1] **Jasso, G.**, Cluster-tilted algebras of canonical type and graded quivers with potential, in: Proceedings of the 15th Workshop on Representation Theory of Algebraic Groups and Quantum Groups, 2012, 13–18.

### Theses and dissertations

- [3] **Jasso, G.**, On  $\tau$ -tilting theory and higher Auslander–Reiten theory, Doctoral dissertation, Nagoya University, 2014, comprises publications [3], [4] and [6].
- [2] **Jasso, G.**, El crecimiento de un álgebra de conglomerados de tipo tubular, Master’s thesis, Universidad Nacional Autónoma de México, 2011, comprises part of publication [1].
- [1] **Jasso, G.**, Álgebras de Lie de tipo extendido y formas cuadráticas, Bachelor’s thesis, Universidad Nacional Autónoma de México, 2010, comprises publication [2].