

# Gustavo Jasso

Doctor of Philosophy

Mathematik Zentrum  
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*“Mathematics knows no races or geographic boundaries; for mathematics, the cultural world is one country.” – D. Hilbert*

## Biographical information

Full name Gustavo Jasso Ahuja  
Birth date March 18, 1987  
Hometown Guadalajara, Mexico  
Nationality Mexican

## Research interests

- Homological algebra and homotopical algebra
- Representation theory of finite dimensional algebras
- Cluster algebras

## Employment history

- 2017– **Akademischer Rat auf Zeit**, *Mathematisches Institut, Rheinische Friedrich-Wilhelms-Universität Bonn*, Bonn, Germany.  
Starting date: October 1, 2017.
- 2014–2017 **Hausdorff Postdoc**, *Hausdorff Center for Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn*, Bonn, Germany.  
Mentor: Prof. Dr. Jan Schröer.  
Starting date: October 1, 2014.  
Ending date: September 30, 2017.
- 2011–2014 **Research assistant**, *Graduate School of Mathematics, Nagoya University*, Nagoya, Japan.

## Education history

- 2011–2014 **Doctor of Philosophy (Mathematical Science)**, *Nagoya University*, Nagoya, Japan.  
Thesis title: On  $\tau$ -tilting theory and higher Auslander–Reiten theory.  
Supervisor: Prof. Dr. Osamu Iyama.  
Degree obtained on September 29, 2014.
- 2009–2011 **Master of Science degree in mathematics (with honorific mention)**, *Universidad Nacional Autónoma de México (UNAM)*, Mexico City, Mexico.  
Thesis title: El crecimiento de un álgebra de conglomerados de tipo tubular.  
Supervisors: Prof. Dr. Michael Barot and Prof. Dr. Christof Geiß.  
GPA: 9.87/10.
- 2005–2010 **Undergraduate degree in mathematics (with honorific mention)**, *Universidad Nacional Autónoma de México (UNAM)*, Mexico City, Mexico.  
Thesis title: Álgebras de Lie de tipo afín extendido y formas cuadráticas.  
Supervisor: Prof. Dr. Michael Barot.  
GPA: 9.84/10.

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## Teaching experience & related duties

- 2017 **Teaching assistant (Assistent)**, *Rheinische Friedrich-Wilhelms-Universität Bonn*, Bonn, Germany, Winter Semester 2016/2017.  
Course: Übungen zu Lineare Algebra I (V1G3).  
Notes: Coordinator of the tutorial sessions for the course Lineare Algebra I taught by Prof. Dr. Jan Schröer (11 tutors).
- 2017 **Research school. New trends in representation theory: the impact of cluster theory on representation theory**, *University of Leicester*, Leicester, UK, 19.06.2016–23.06.2017.  
Notes: Tutorial sessions for the course “ $n$ -representation theory” imparted by Prof. Dr. Peter Jørgensen.
- 2016 **Lecturer**, *Rheinische Friedrich-Wilhelms-Universität Bonn*, Bonn, Germany, Winter Semester 2016/2017.  
Course: Advanced Topics in Representation Theory (V5A5) - Differential graded categories, a representation theoretic approach.  
Notes: Master’s course taught through the Hausdorff Center for Mathematics Mentoring Program under the mentoring of Prof. Dr. Jan Schröer (29 lectures, 43.5 hours teaching time).
- 2010 **Teaching assistant**, *Facultad de Ciencias, Universidad Nacional Autónoma de México (FC-UNAM)*, Mexico City, Mexico.  
Course: Álgebra lineal I (in Spanish).  
Lecturer: Raúl González Silva.
- 2015– **Second advisor (Prüfer) for master thesis in mathematics**, *Rheinische Friedrich-Wilhelms-Universität Bonn*, Bonn, Germany.  
Notes: This is the role of an *examiner and rapporteur* and not the role of an advisor (despite the adopted English translation).
- Islam Foniqi, “Finite Representation Type is Open” (Prof. Dr. Schröer, 2017)
  - Daniel Rehn, “Modules without Self-extensions over Path Algebras” (Prof. Dr. Schröer, 2017)
  - Bunlong Lay, “Crawley–Boevy–Kerner functor” (Prof. Dr. Schröer, 2017)
  - Jonas Röhrig, “Stable Components of Auslander–Reiten Quivers of Representation-Finite Algebras” (Prof. Dr. Schröer, 2017).
  - Leon Lang, “Asymptotic behaviour of Auslander–Reiten translations” (Prof. Dr. Schröer, 2017).
  - Mário Marcelo da Conceição Cardoso, “The global dimension of endomorphism rings of generator-cogenerators over Nakayama algebras” (Prof. Dr. Schröer, 2017).
  - Malte Leip, “Relative Calabi–Yau Structures over Commutative Ring Spectra” (Prof. Dr. Dyckerhoff, 2017).
  - Vanessa Geierse, “Representation Theory of Polyquivers” (Prof. Dr. Schröer, 2015).

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## Academical distinctions

- 2011–2014 **Scholarship for studying abroad (Ph.D. program)**, *Consejo Nacional de Ciencia y Tecnología (CONACyT)*, Mexico City, Mexico.
- 2010–2011 **Scholarship for the M.Sc. program in mathematics**, *Consejo Nacional de Ciencia y Tecnología (CONACyT)*, Mexico City, Mexico.
- 2010 **Sotero Prieto Award**, *Sociedad Matemática Mexicana*, Tuxtla Gutiérrez, Mexico.  
Notes: Awarded to the best undergraduate thesis in mathematics presented at a Mexican institution between June 2009 and May 2010 (three theses were recognized).
- 2009–2010 **PAPIIT Scholarship CB-2007/81948**, *Universidad Nacional Autónoma de México (UNAM)*, Mexico City, Mexico.

2009–2011 **Student fellow**, *Instituto de Matemáticas, Universidad Nacional Autónoma de México (IM-UNAM)*, Mexico City, Mexico.

## Research appointments

- 2018 **Mathematisches Forschungsinstitut Oberwolfach**, Oberwolfach, Germany.  
Mini-Workshop: Chromatic Phenomena and Duality in Homotopy Theory and Representation Theory.  
Period: 04.03.2018–10.03.2018.
- 2018 **BIRS/Casa Matemática Oaxaca**, Oaxaca, Mexico.  
Workshop: Stability Conditions and Representation Theory of Finite-Dimensional Algebras.  
Period: 28.10.2018–02.11.2018 (scheduled).
- 2017 **Hausdorff Research Institute for Mathematics**, Bonn, Germany.  
Junior Hausdorff Trimester Program “Symplectic Geometry and Representation Theory”  
Period: 01.11.2017–21.12.2017 (scheduled).  
Notes: Leader of the group ‘Mirror symmetry, Fukaya categories and Auslander–Reiten theory’ (this is an administrative role).
- 2017 **University of California, Berkeley**, Berkeley CA, USA.  
Host: Prof. Dr. Lauren Williams.  
Period: 01.10.2017–31.10.2017.
- 2017 **Universität Stuttgart**, Stuttgart, Germany.  
Host: Dr. Julian Külshammer.  
Period: 03.04.2017–05.04.2017.
- 2017 **Mathematisches Forschungsinstitut Oberwolfach**, Oberwolfach, Germany.  
Workshop: Representation Theory of Quivers and Finite Dimensional Algebras.  
Period: 20.02.2017–25.02.2017.
- 2016 **Norges teknisk-naturvitenskapelige universitet (NTNU)**, Trondheim, Norway.  
Hosts: Prof. Dr. Petter Bergh and Dr. Marius Thaulé.  
Period: 08.06.2016–22.06.2016.
- 2015 **Universität Stuttgart**, Stuttgart, Germany.  
Host: Dr. Julian Külshammer.  
Period: 02.11.2015–25.11.2015.
- 2015 **Instituto de Matemáticas, Universidad Nacional Autónoma de México (IM-UNAM)**, Mexico City, Mexico.  
Hosts: Prof. Dr. Christof Geiß and Prof. Dr. Octavio Mendoza.  
Period: 18.09.2015–18.10.2015.
- 2015 **Universität Stuttgart**, Stuttgart, Germany.  
Host: Dr. Julian Külshammer.  
Period: 07.07.2015–17.07.2015.
- 2015 **Norges teknisk-naturvitenskapelige universitet (NTNU)**, Trondheim, Norway.  
Hosts: Prof. Dr. Petter Bergh and Dr. Marius Thaulé.  
Period: 08.06.2015–14.06.2016.
- 2015 **Institut Mittag-Leffler**, *postdoc fellowship*, Djursholm, Sweden.  
Program: Representation Theory.  
Period: 22.03.2015–22.05.2015.
- 2015 **Universität Stuttgart**, Stuttgart, Germany.  
Host: Dr. Julian Külshammer.  
Period: 19.01.2015–30.01.2015.

## Academical work

- 2017 **Oberseminar Darstellungstheorie**, *Rheinische Friedrich-Wilhelms-Universität Bonn*, Bonn, Germany, Winter Semester 2017/2018.  
Notes: Organiser of the research seminar on representation theory at the Mathematisches Institute of the Rheinische Friedrich-Wilhelms-Universität Bonn.

- 2017 **Workshop:  $A_\infty$ -structures in geometry and representation theory**, Hausdorff Research Institute for Mathematics (HIM), Bonn, Germany, 04.12.2017–08.12.2017.  
Organiser (jointly with Dr. Julian Külshammer).  
Notes: The workshop is part of the scientific program of the “Junior Hausdorff Trimester Program: Symplectic Geometry and Representation Theory.”
- 2017 **Spring school: Cluster Algebras in Mathematical Physics (CAMP)**, Johannes Gutenberg-Universität Mainz, Mainz, Germany, 27.03.2017–31.03.2017.  
Member of the Scientific Committee.  
Notes: The spring school is part of the graduate program of the SFB/Transregio 45.
- 2010 **Festival Matemático del Instituto de Matemáticas**, Instituto de Matemáticas, Universidad Nacional Autónoma de México (IM-UNAM), Mexico City, Mexico.  
Member of the Organising Committee.
- 2009 **Social service for the undergraduate program in mathematics**, Facultad de Ciencias, Universidad Nacional Autónoma de México (FC-UNAM), Mexico City, Mexico.  
Notes: Translation to the English language of the book “Un paseo por Hiperbolía” written by Prof. Dr. Michael Barot and edited by the Sociedad Matemática Mexicana (the translation is unpublished).

## Editorial work

### Reviewer for the following services

- Mathematical Reviews (5)

### Referee for the following journals

- Advances in Mathematics (1)
- Algebras and Representation Theory (3)
- Applied Categorical Structures (1)
- Communications in Algebra (2)
- Czechoslovak Mathematical Journal (1)
- Frontiers of Mathematics in China (1)
- Homology, Homotopy and Applications (1 in progress)
- International Mathematics Research Notices (2)
- Journal of Pure and Applied Algebra (1)

## List of publications

### Preprints

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- [1] Gustavo Jasso and Sondre Kvamme. An introduction to higher Auslander–Reiten theory. *arXiv:1610.05458*, oct 2016.
- [2] Gustavo Jasso and Julian Külshammer. Higher Nakayama algebras I: Construction. *arXiv:1604.03500*, apr 2016.

### Published

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- [1] Laurent Demonet, Osamu Iyama, and Gustavo Jasso.  $\tau$ -tilting finite algebras, bricks and  $g$ -vectors. *Int. Math. Res. Not. IMRN*. Accepted for publication.
- [2] Osamu Iyama and Gustavo Jasso. Higher Auslander Correspondence for Dualizing R-Varieties. *Algebr. Represent. Theory*, 20(2):335–354, 2017.
- [3] Gustavo Jasso.  $n$ -abelian and  $n$ -exact categories. *Math. Z.*, 283(3-4):703–759, 2016.

- [4] Petter Andreas Bergh, Gustavo Jasso, and Marius Thaule. Higher  $n$ -angulations from local rings. *J. Lond. Math. Soc. (2)*, 93(1):123–142, 2016.
- [5] Gustavo Jasso.  $\tau^2$ -stable tilting complexes over weighted projective lines. *Adv. Math.*, 273:1–31, 2015.
- [6] Gustavo Jasso. Reduction of  $\tau$ -tilting modules and torsion pairs. *Int. Math. Res. Not. IMRN*, (16):7190–7237, 2015.
- [7] Gustavo Jasso. The extended affine Lie algebra associated with a connected non-negative unit form. *J. Algebra*, 409:148–161, 2014.
- [8] Michael Barot, Christof Geiß, and Gustavo Jasso. Tubular cluster algebras II: Exponential growth. *J. Pure Appl. Algebra*, 217(10):1825–1837, 2013.

#### [Proceedings](#)

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- [1] Gustavo Jasso and Julian Külshammer. Nakayama-type phenomena in higher Auslander–Reiten theory. In *Proceedings of the 17th Workshop and International Conference on Representations of Algebras (ICRA 2016)*.

#### [Book project](#)

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- [1] Gustavo Jasso. *Differential graded categories. A representation theoretic approach*. In preparation.

## Talks in conferences, workshops and seminars

### Invited talks

- Sep 2018 **Advances in Representation Theory of Algebras (ARTA VII)**, *Instituto de Matemáticas, Universidad Nacional Autónoma de México (IM-UNAM)*, Mexico City, Mexico, (scheduled).  
Title: TBD.
- Jun 2017 **Idun 75. A conference on representation theory of Artin algebras on the occasion of Idun Reiten’s birthday**, *Norges teknisk-naturvitenskapelige universitet (NTNU)*, Trondheim, Norway.  
Title: Type  $\mathbb{A}$  phenomena in higher Auslander–Reiten theory.
- Sep 2016 **Algebra and Representation Theory in the North (ARTIN) 48**, *Newcastle University*, Newcastle upon Tyne, UK.  
Title: Mesh categories of type  $\mathbb{Z}A_\infty$  and tubes in higher Auslander–Reiten theory.
- May 2016 **Second meeting of the US-Mexico Conference on Representation theory, Categorification, and Noncommutative Algebra**, *University of Southern California*, Los Angeles CA, USA.  
Title: Higher Nakayama Algebras
- Mar 2016 **Cluster Algebras and Geometry**, *Westfälische Wilhelms-Universität Münster*, Münster, Germany.  
Title: Higher Nakayama Algebras.
- Oct 2015 **Jornadas de Álgebra 2015**, *Instituto de Matemáticas, Universidad Nacional Autónoma de México (IM-UNAM)*, Mexico City, Mexico.  
Title: From  $G$ -sets to dg modules.
- Jul 2015 **Workshop: Silting theory and related topics**, *Università degli Studi di Verona*, Verona, Italy.  
Title:  $\tau$ -rigid finite algebras.

- Jun 2015 **Advances in Representation Theory of Algebras IV (ARTA IV)**, *Centro de Investigación en Matemáticas, A.C. (CIMAT)*, Guanajuato, Mexico.  
Title: From higher Auslander–Reiten theory to higher homological algebra.
- Mar 2015 **Maurice Auslander International Conference**, *Woods Hole Oceanographic Institute*, Woods Hole MA, USA.  
Title: The  $d$ -abelian property of  $d$ -cluster-tilting subcategories.
- Dec 2014 **Homological Interactions between Representation Theory and Singularity Theory**, *University of Edinburgh*, Edinburgh, Scotland.  
Title: Towards higher homological algebra.
- Selected talks**
- Sep 2017 **Advances in Representation Theory of Algebras VI: Geometry and Homology (ARTA VI)**, *Centre International de Rencontres Mathématiques (CIRM)*, Luminy, France.  
Title: Triangulations of cyclic apeirotopes and higher dimensional tilting combinatorics.
- Feb 2017 **Workshop: Representation Theory of Quivers and Finite Dimensional Algebras**, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach, Germany.  
Title: Spherical objects in higher Auslander–Reiten theory.
- Oct 2015 **Workshop: “Preprojective Algebras Interacting with Singularities, Cohen-Macaulay Modules and Weighted projective Spaces”**, *BIRS/Casa Matemática Oaxaca*, Oaxaca, Mexico.  
Title: Higher Nakayama Algebras
- May 2015 **‘Tell us about...’ Seminar**, *Institut Mittag-Leffler*, Djursholm, Sweden.  
Title: An introduction to  $\tau$ -tilting theory.
- Aug 2014 **XVI International Conference on Representations of Algebras and Workshop**, *Tsinghua Sanya International Mathematics Forum*, Sanya, China.  
Title:  $n$ -abelian categories and  $n$ -exact categories.
- Nov 2013 **Perspectives of Representation Theory of Algebras. Conference honoring Kunio Yamagata on the occasion of his 65th birthday**, *Nagoya University*, Nagoya, Japan.  
Title: On the simplicial complex associated with support  $\tau$ -tilting modules.
- Oct 2013 **Oberwolfach Seminar: Cluster Algebras and Representation Theory**, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach, Germany.  
Title:  $\tau$ -tilting theory.
- Aug 2012 **XV International Conference on Representations of Algebras and Workshop**, *Bielefeld University*, Bielefeld Germany.  
Title:  $\tau$ -tilting reduction.
- Aug 2010 **XIV International Conference on Representations of Algebras and Workshop**, Tokyo, Japan.  
Title: The extended affine Lie algebra associated with a connected non-negative unit form.

## Languages

**Spanish**, *native language*.

**English**, *fluent in speaking, reading and writing*.

TOEFL iBT: 114/120 (November 2010).

**German**, *intermediate*.

Roughly at level B1 of the CEFRL.