

# Pablo S. Ocal

## Curriculum Vitae

Texas A&M University  
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### Education

- 2016–present **Ph.D. Student, Mathematics**, Texas A&M University, TX.  
Advisor: Sarah Witherspoon
- 2015–2016 **M.Sc., Mathematics**, Université Pierre-et-Marie-Curie (Paris VI), France.  
Advisor: Bruno Kahn
- 2010–2015 **B.Sc., Mathematics**, Universitat Autònoma de Barcelona, Spain.  
Advisor: Jaume Aguade Bover
- 2010–2015 **B.Sc., Physics**, Universitat Autònoma de Barcelona, Spain.  
Advisor: Anna Laromaine

### Publications and Preprints

- 2 **Homotopy liftings and Hochschild cohomology of some twisted tensor products**, with T. Oke and S. Witherspoon.  
• arXiv:2005.06660 (submitted).
- 1 **Gerstenhaber brackets on Hochschild cohomology of general twisted tensor products**, with T. Karadag, D. McPhate, T. Oke, and S. Witherspoon.  
• arXiv:1909.02181 (submitted).

### Visiting Positions

- Spring 2020 **Program Associate**, Mathematical Sciences Research Institute.  
• Program: Quantum Symmetries

### Conference Talks

2021

- Jan **The Gerstenhaber bracket in relative Hochschild cohomology**, Joint Mathematics Meetings, Washington, District of Columbia.

2020

- Aug **Homotopy liftings and Hochschild cohomology of some twisted tensor products**, Encuentro Virtual de Álgebra Homológica, Universidad de Buenos Aires, Universidad Nacional de Mar del Plata, Universidad Nacional del Sur, Argentina.
- †May **On the Gerstenhaber bracket in relative Hochschild cohomology of associative algebras**, A Zoom Special Session on DG Methods in Commutative Algebra and Representation Theory, University of Utah.
- †May **On the Gerstenhaber bracket in relative Hochschild cohomology of associative algebras**, AMS Spring Western Sectional Meeting, California State University, Fresno.

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†Canceled or hosted online due to COVID-19.

- †Apr **Hochschild cohomology of twisted tensor product algebras**, Graduate Student Topology and Geometry Conference, Indiana University Bloomington.
- †Apr **Hochschild cohomology of twisted tensor products**, Underrepresented Students in Topology and Algebra Research Symposium, University of Iowa.
- Mar **The Gerstenhaber bracket on relative Hochschild cohomology**, Southwest Local Algebra Meeting, Tulane University.
- Feb **On the Hochschild cohomology ring of some twisted tensor products of algebras**, Seattle Noncommutative Algebra Day, University of Washington.

## 2019

- Jul **Hochschild cohomology of twisted tensor product algebras**, Ragnar's Ramifications in Algebra and Geometry Emerging Workshop, Fields Institute for Research in Mathematical Sciences, Canada.
- Jul **Hochschild cohomology of twisted tensor product algebras**, Research School on Quantum Symmetries, Universidad de los Andes, Colombia.
- Jun **Hochschild cohomology of twisted tensor product algebras (and brackets for certain quantum complete intersections)**, Graduate Student Conference in Algebra, Geometry, and Topology, Temple University.
- Apr **Hochschild cohomology of twisted tensor product algebras**, Texas-Oklahoma Representations and Automorphic Forms, University of North Texas.
- Mar **Hochschild cohomology of twisted tensor product algebras**, Graduate Student Conference in Geometry and Topology, University of Illinois at Urbana-Champaign.
- Mar **Twisted tensor product algebras and compatibility of the bar resolution**, Graduate Algebra Symposium, University of Oklahoma.
- Feb **An algebraist's view of the multinomial coefficients**, Gathering in Graduate Expository Mathematics, Texas A&M University.

## 2018

- Oct **Relative Hochschild cohomology and its Gerstenhaber product**, Graduate Algebra Symposium, University of Texas at Arlington.
- Apr **Using relative homological algebra in Hochschild cohomology**, Graduate Algebra Symposium, University of North Texas.
- Mar **Using relative homological algebra in Hochschild cohomology**, Gathering in Graduate Expository Mathematics, Texas A&M University.

## Seminar Talks

### 2020

- Nov **TBD**, Algebra and Combinatorics Seminar, Texas A&M University.
- TBD **TBD**, Algebra Seminar, University of Texas at Arlington.
- Nov **TBD**, Algebra and Geometry Seminar, Iowa State University.
- Oct **TBD**, Algebra Seminar, University of Washington.
- Oct **TBD**, Algebra Seminar, University of Oregon.
- Oct **TBD**, Seminario de Algebra Homologica y Hierbas Afines, Universidad de Buenos Aires, Argentina.

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† Canceled or hosted online due to COVID-19.

- Sep **TBD**, *Algebra and Number Theory Seminar*, Louisiana State University.
- Sep **TBD**, *Algebra and Number Theory Seminar*, Texas Tech University.
- Sep **Interplays of Hochschild cohomology in quantum symmetries**, *Quantum Symmetries Student Seminar*, The Ohio State University.
- Aug **The vector space structure of the quantized enveloping algebra**, *Quantum Symmetries Seminar*, Texas A&M University.
- Aug **Representations of the special linear Lie algebra of order two**, *Quantum Symmetries Seminar*, Texas A&M University.
- Apr **Structures in Hochschild cohomology**, *MSRI Online Seminar*, Mathematical Sciences Research Institute.
- <sup>†</sup>Apr **Twisted tensor products and brackets in Hochschild cohomology**, *Graduate Student Seminar*, Mathematical Sciences Research Institute.
- <sup>†</sup>Apr **Inner workings of the Hochschild cohomology of some twisted tensor products**, *Algebra and Geometry Seminar*, Iowa State University.
- 2019**
- Oct **Hermitian forms, the spectral theorems, and alternating forms**, *Student Working Seminar in Algebra and Geometry*, Texas A&M University.
- Sep **An overview of duality**, *Graduate Student Seminar*, Texas A&M University.
- Sep **Functors and multi-functors between semisimple categories**, *Quantum Symmetries Seminar*, Texas A&M University.
- Sep **Matrices, rank, linear maps, and determinants**, *Student Working Seminar in Algebra and Geometry*, Texas A&M University.
- Feb **Open and closed subschemes, open and closed immersions**, *Student Working Seminar in Algebra and Geometry*, Texas A&M University.
- Feb **An introduction to relative homological algebra through group algebras**, *Graduate Student Seminar*, Texas A&M University.
- 2018**
- Sep **An approach to determinants**, *Graduate Student Seminar*, Texas A&M University.
- 2017**
- Sep **Hochschild cohomology**, *Student Working Seminar in Algebra and Geometry*, Texas A&M University.
- 2016**
- Sep **Categories, functors, and natural transformations**, *Student Working Seminar in Algebra and Geometry*, Texas A&M University.
- Jul **A reading on “Algebraic coherent sheaves” by J.-P. Serre**, *M.Sc. defense*, Université Pierre-et-Marie-Curie, France.
- 2015**
- Jul **Triality: a particularity of  $Spin(8)$** , *B.Sc. defense*, Universitat Autònoma de Barcelona, Spain.

## Scholarships and Awards

<sup>†</sup>Canceled or hosted online due to COVID-19.

- 2016–2018 **E. R. Keown Fellow in Mathematics**, Texas A&M University.
- 2015 **Fulbright Scholarship**, Fulbright Program, Spain.
- 2015 **X Becas de Postgrado**, Fundacion Mutua Madrileña, Spain.
- 2012 **JAE Intro**, Instituto de Ciencias Matematicas, Spain.
- Program: Introduction to Ramsey Theory
- 2010 **VII Concurs EIDEA**, Escola Hamelin-Internacional Laie, Spain.
- 2010 **Matricula de Honor en Bachillerato**, Universitat Autonoma de Barcelona, Spain.
- 2010 **Joves i Ciencia**, Imperial College London, United Kingdom.
- Program: London International Youth Science Forum (LIYSF)
- 2010 **Premio Excelencia UIC**, Universitat Internacional de Catalunya, Spain.
- 2009 **Joves i Ciencia**, Institut de Ciencies Fotoniques, Spain.
- Program: Classic and Quantum Cryptography
- 2008 **Joves i Ciencia**, Planes de Son, Spain.
- Program: Mathematics in Unlikely Places

## Professional Service

### Conference Organization

**AMS Sectional Meeting**, United States.

- Spring Eastern 2021: *Hopf algebras, tensor categories, and related homological methods*

**Graduate Algebra Symposium**, Texas.

- Fall 2020: University of Texas at Arlington
- Spring 2019: University of North Texas
- Fall 2019: Texas A&M University

**Gathering in Graduate Expository Mathematics**, Texas A&M University.

- Fall 2020
- Spring 2019

### Seminar Organization

**Quantum Symmetries Seminar**, Texas A&M University.

- Fall 2020
- Fall 2019

**Student Working Seminar in Algebra and Geometry**, Texas A&M University.

- Fall 2020
- Spring 2020
- Fall 2019
- Spring 2019
- Fall 2018

### Directed Reading Programs

**University of California, Berkeley.**

- Spring 2020: Mentor

**Texas A&M University.**

- 2020–present: Organizer
- Fall 2019: Mentor
- Spring 2019: Mentor

### Student Government

**AMS Chapter**, Texas A&M University.

- 2020–2021: Vice-President
- 2018–2019: Vice-President

**AWM Chapter Peer Mentoring Program**, Texas A&M University.

- 2018–present: Mentor

**Fulbright Student Association**, Texas A&M University.

- 2017–2018: IT officer and Webmaster

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## Teaching

Texas A&M University

**Instructor.**

- Summer 2020: Math 663 (Algebra Qualifying Exam Preparatory Course)
- Summer 2020: Summer Educational Enrichment in Math
- Fall 2019: Math 141 (Finite Mathematics)
- Summer 2019: Summer Educational Enrichment in Math

**Graduate Teaching Assistant.**

- Fall 2020: Math 152 (Engineering Mathematics II)
- Spring 2019: Math 654 (Algebra II)
- Fall 2018: Math 653 (Algebra I)

Universitat Autònoma de Barcelona

**Undergraduate Teaching Assistant.**

- Fall 2014: Foundations of Mathematics

Private Tutor

**Undergraduate algebra and calculus, high school mathematics and physics.**

- 2008–2015

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## Outreach and Service

Panel Discussions

**First Year Graduate Student Seminar**, Texas A&M University.

- Fall 2020: Outreach Opportunities
- Spring 2019: Choosing an Advisor
- Fall 2017: Adjusting to Graduate School

Math Circles

**Bridges to Science (Katy, TX).**

- Summer 2020: Speaker

**University of California, Berkeley.**

- Spring 2020: Speaker

**San Francisco State University.**

- Spring 2020: Volunteer

**Texas A&M University.**

- Fall 2019: Speaker
- Spring 2019: Speaker
- 2016–present: Volunteer

Science Contests

**Texas Science Olympiad**, Texas A&M University.

- Spring 2019: Volunteer

**Regional Science Bowl**, Texas A&M University.

- Spring 2019: Moderator
- Spring 2018: Scientific Judge
- Spring 2017: Scientific Judge

**Junior Science Bowl**, Texas A&M University.

- Spring 2018: Moderator

**Integral Bee**, Texas A&M University.

- Spring 2020: Volunteer
- Spring 2018: Volunteer

**Derivative Bee**, Texas A&M University.

- Fall 2019: Volunteer
- Fall 2018: Volunteer
- Fall 2017: Volunteer

**High School Math Contest**, Texas A&M University.

- Fall 2018: Grader
- Fall 2017: Grader
- Fall 2016: Grader

Science Fairs

**Math and Stat Fair**, Texas A&M University.

- Spring 2017: Volunteer

**1a Semana de la Ciencia de Paris**, Colegio de España (Paris, France).

- Spring 2016: Volunteer

**Dissabtes de les Matemàtiques**, Universitat Autònoma de Barcelona.

- 2011–2015: Volunteer

Student Government

**Graduate and Professional Student Government**, Texas A&M University.

- 2019: Senator
- Spring 2017: Participant

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**Conferences and Workshops** (*All events were fully or partially funded.*)

**2021**

Jan **Joint Mathematics Meetings**, Washington, District of Columbia.

**2020**

Aug **Encuentro Virtual de Álgebra Homológica**, Universidad de Buenos Aires, Universidad Nacional de Mar del Plata, Universidad Nacional del Sur, Argentina.

Aug **Operad Pop-Up**, MATRIX, Australia.

†Aug **Quantum groups, Categorification, Knot invariants, and Soergel bimodules**, University of Oregon.

†Jul **Applied Category Theory**, Massachusetts Institute of Technology.

†Jul **Workshop on Homotopy Type Theory/Univalent Foundations**, Oxford, United Kingdom.

†Jun **Tensor Categories, Quantum Groups and Related Topics**, University of Nottingham, United Kingdom.

May **Cross Atlantic Representation Theory and Other Topics Online**, University of Michigan.

- May **A Zoom Special Session on DG Methods in Commutative Algebra and Representation Theory**, *University of Utah*.
- †May **AMS Spring Western Sectional Meeting**, *California State University, Fresno*.
- †Apr **Graduate Student Topology and Geometry Conference**, *Indiana University Bloomington*.
- †Apr **Underrepresented Students in Topology and Algebra Research Symposium**, *University of Iowa*.
- †Apr **Algebra and Geometry Seminar**, *Iowa State University*.
- Mar **Arithmetic Geometry is Online in Zoom, Everyone**, *University of Georgia*.
- †Mar  **$(\infty, n)$ -Categories, Factorization Homology, and Algebraic  $K$ -Theory**, *Mathematical Sciences Research Institute*.
- †Mar **Tensor Categories and Topological Quantum Field Theories**, *Mathematical Sciences Research Institute*.
- †Mar **Critical Issues in Mathematics Education 2020: Today's Mathematics, Social Justice, and Implications for Schools**, *Mathematical Sciences Research Institute*.
- Mar **Southwest Local Algebra Meeting**, *Tulane University*.
- Feb **Seattle Noncommutative Algebra Day**, *University of Washington*.
- Feb **Introductory Workshop: Higher Categories and Categorification**, *Mathematical Sciences Research Institute*.
- Feb **Connections for Women: Higher Categories and Categorification**, *Mathematical Sciences Research Institute*.
- Jan **Introductory Workshop: Quantum Symmetries**, *Mathematical Sciences Research Institute*.
- Jan **Connections for Women: Quantum Symmetries**, *Mathematical Sciences Research Institute*.
- 2019**
- Nov **Texas Geometry and Topology Conference**, *Texas A&M University*.
- Oct **Graduate Algebra Symposium**, *Texas A&M University*.
- Oct **Texas Algebraic Geometry Seminar**, *Texas A&M University*.
- Jul **Ragnar's Ramifications in Algebra and Geometry Emerging Workshop**, *Fields Institute for Research in Mathematical Sciences, Canada*.
- Jun **Research School on Quantum Symmetries**, *Universidad de los Andes, Colombia*.
- Jun **Commutative Algebra and its Interaction with Algebraic Geometry**, *University of Notre Dame*.
- Jun **Summer Research Program on Quantum Symmetries**, *Ohio State University*.
- Jun **Graduate Student Conference in Algebra, Geometry, and Topology**, *Temple University*.
- May **Homotopy meets Homology**, *Hamilton Mathematics Institute at Trinity College Dublin, Ireland*.
- Apr **Texas-Oklahoma Representations and Automorphic Forms**, *University of North Texas*.
- Mar **Graduate Student Topology and Geometry Conference**, *University of Illinois at Urbana-Champaign*.

- Mar **Graduate Algebra Symposium**, *University of Oklahoma*.
- Feb **Southwest Local Algebra Meeting**, *University of Texas at El Paso*.
- Feb **Gathering in Graduate Expository Mathematics**, *Texas A&M University*.
- Feb **Texas Algebraic Geometry Symposium**, *University of Texas at Austin*.
- Jan **Frobenius Action in Commutative Algebra: Recent Developments**, *Institut de Matematica de la Universitat de Barcelona, Spain*.
- Jan **Categorification in Quantum Topology and Beyond**, *Erwin Schrodinger International Institute for Mathematics and Physics, Austria*.

## 2018

- Nov **Texas Algebraic Geometry Seminar**, *Texas A&M University*.
- Oct **Graduate Algebra Symposium**, *University of Texas at Arlington*.
- Sep **Quantum Computation and Information Workshop**, *Texas A&M University*.
- Jul **ICM 2018 Satellite Meeting: A Pan-Hemispheric Celebration of Mathematics in Miami**, *University of Miami*.
- Jun **Workshop in Geometric Topology**, *Calvin College*.
- May **Stable Cohomology: Foundations and Applications**, *Snowbird*.
- Apr **Graduate Algebra Symposium**, *University of North Texas*.
- Apr **Texas Algebraic Geometry Symposium**, *Texas A&M University*.
- Mar **Gathering in Graduate Expository Mathematics**, *Texas A&M University*.

## 2017

- Jun **Research Computing Week**, *Texas A&M University*.

## 2016

- Nov **Texas Geometry and Topology Conference**, *Texas A&M University*.
- Mar **Seminaire Grothendieck**, *Institut des Hautes Etudes Scientifiques, France*.

## 2013

- Jul **6a Escuela JAE de Matematicas**, *Instituto de Ciencias Matematicas, Spain*.

## 2012

- Jul **5a Escuela JAE de Matematicas**, *Instituto de Ciencias Matematicas, Spain*.