

Pablo S. Ocal

Curriculum Vitae

Texas A&M University
College Station, TX 77843-3368
✉ pablosanchezocal@gmail.com
📧 math.ucla.edu/~socal

Employment

2021–present **Assistant Adjunct Professor**, *University of California, Los Angeles, CA.*
Mentor: Paul Balmer

Visiting Positions

Fall 2022 **Program Fellow**, *Spectral Methods in Algebra, Geometry, and Topology*, Hausdorff Research Institute for Mathematics.
Spring 2020 **Program Associate**, *Quantum Symmetries*, Mathematical Sciences Research Institute.
Mentors: Cris Negron and Chelsea Walton

Education

2016–2021 **Ph.D., Mathematics**, *Texas A&M University, TX.*
Advisor: Sarah Witherspoon
2015–2016 **M.Sc., Mathematics**, *Universite 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

- 5 ***A primer on twists in the noncommutative realm focusing on algebra, representation theory, and geometry***, with K. Ueyama and P. Veerapen, to appear in *Recent Advances and New Directions in the Interplay of Noncommutative Algebra and Geometry, Contemporary Mathematics*.
• arXiv:2211.15885
- 4 ***B_∞ structures, monoidal categories, and singularity categories***, with B. Keller, to appear in *Special issue on deformation theory and higher structures, Rend. Mat. Appl.*.
- 3 ***A dichotomy between twisted tensor products of bialgebras and Frobenius algebras***, with A. Oswald.
• arXiv:2211.14754
- 2 ***Homotopy liftings and Hochschild cohomology of some twisted tensor products***, with T. Oke and S. Witherspoon, *J. Algebra Appl.*, 2021.
• arXiv:2005.06660
- 1 ***Gerstenhaber brackets on Hochschild cohomology of general twisted tensor products***, with T. Karadag, D. McPhate, T. Oke, and S. Witherspoon, *J. Pure Appl. Algebra*, 2021.
• arXiv:1909.02181

Scholarships and Awards

- 2022–2024 **AMS-Simons Travel Grant**, American Mathematical Society and Simons Foundation.
- 2022 **Kovalevskaya Grant**, ICM Local Organizing Committee.
International Congress of Mathematicians
- 2022 **AMS-NSF-Simons-ICM Travel Grant**, American Mathematical Society.
International Congress of Mathematicians
- 2021 **Travel Grant**, American Mathematical Society.
Mathematical Congress of the Americas
- 2021 **Virtual Graduate Student Travel Grant**, American Mathematical Society.
Joint Mathematics Meetings
- 2016–2018 **E. R. Keown Fellow in Mathematics**, Texas A&M University.
- 2016–2021 **Fulbright Scholarship**, Fulbright Program, Spain.
- 2015–2016 **X Becas de Postgrado**, Fundacion Mutua Madrileña, Spain.
- 2012 **JAЕ 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

Conference Talks

2022

- Oct ***Towards a relative support theory***, *AMS Fall Western Sectional Meeting*, University of Utah.
- Oct ***Lattices, the Balmer spectrum, and representations of algebras***, *AMS Fall Western Sectional Meeting*, University of Utah.
- Jun ***Towards a relative support theory***, *Recent Advances and New Directions in the Interplay of Noncommutative Algebra and Geometry*, University of Washington.
- Jun ***The relative Künneth theorem or the search for a relative support***, *Homological Commutative Algebra and Related Topics*, Georgia Southern University.
- [†]Jan ***The relative Künneth theorem in relative Hochschild cohomology***, *Joint Mathematics Meetings*, Seattle, WA.

2021

- [†]Nov ***The Relative Künneth Theorem***, *AMS Fall Southeastern Sectional Meeting*, University of South Alabama.

[†] Canceled or hosted online due to COVID-19.

- †Oct ***The Relative Künneth Theorem***, AMS Fall Western Sectional Meeting, University of New Mexico.
- †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 Algebra Homologica, 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.
- †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.

†Canceled or hosted online due to COVID-19.

- Mar ***Using relative homological algebra in Hochschild cohomology***, *Gathering in Graduate Expository Mathematics*, Texas A&M University.

Selected Seminar Talks

2022

- Nov ***Lattices, the Balmer spectrum, and representations of algebras***, *Algebra Seminar*, Uppsala University, Sweden.
- Oct ***Principles of support varieties for relative Hochschild cohomology***, *Algebra and Representation Theory Seminar*, The University of Oklahoma.
- Aug ***Lattices, the Balmer spectrum, and representations of algebras***, *3 weeks of Representation Theory in Canterbury*, University of Kent, United Kingdom.
- Jul ***Lattices, the Balmer spectrum, and representations of algebras***, *Seminario de Algebra Homologica y Hierbas Afines*, Universidad de Buenos Aires, Argentina.
- Mar ***Stable categories in modular representation theory***, *Algebra Seminar*, University of California, Los Angeles.
- Mar ***Understanding twisted tensor products through deformations***, *Algebra Seminar*, University of California, Irvine.

2021

- Jul ***The relative Künneth theorem***, *Building Relationships for an Inclusive and Diverse Group of Emerging Students*, University of Utah.
- May ***Hochschild cohomology of general twisted tensor products***, *Seminario Moduli, Algebre, Anelli*, University of Padua, University of Verona.
- Mar ***Hochschild cohomology of general twisted tensor products***, *Topology Seminar*, Bilkent University.

2020

- Nov ***Hochschild cohomology of general twisted tensor products***, *Algebra and Combinatorics Seminar*, Texas A&M University.
- Nov ***Hochschild cohomology of general twisted tensor products***, *Algebra and Algebraic Geometry Seminar*, University of Washington.
- Nov ***Hochschild cohomology of general twisted tensor products***, *Algebra Seminar*, University of Texas at Arlington.
- Nov ***Hochschild cohomology of general twisted tensor products***, *Algebra and Geometry Seminar*, Iowa State University.
- Nov ***Hochschild cohomology of general twisted tensor products***, *Algebra Seminar*, Indiana University Bloomington.
- Oct ***Hochschild cohomology of general twisted tensor products***, *Representation Theory and Related Topics Seminar*, Northeastern University.
- Oct ***Hochschild cohomology of general twisted tensor products***, *Lie Theory Seminar*, University of California, Riverside.
- Oct ***Hochschild cohomology of general twisted tensor products***, *Seminario de Algebra Homologica y Hierbas Afines*, Universidad de Buenos Aires, Argentina.
- Oct ***Hochschild cohomology of general twisted tensor products***, *Algebra Seminar*, University of Oregon.

- Oct **Summary on Lie algebras and their representations**, Learning Seminar on Topological Quantum Field Theories and Invariants of Low-dimensional Manifolds, Rice University.
- Sep **Hochschild cohomology of general twisted tensor products**, Algebra and Number Theory Seminar, Louisiana State University.
- Sep **Hochschild cohomology of general twisted tensor products**, Algebra and Number Theory Seminar, Texas Tech 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.
- [†]Apr **Inner workings of the Hochschild cohomology of some twisted tensor products**, Algebra and Geometry Seminar, Iowa State University.
- 2019**
- Sep **Functors and multi-functors between semisimple categories**, Quantum Symmetries Seminar, Texas A&M University.
- 2016**
- Jul **A reading on “Algebraic coherent sheaves” by J.-P. Serre**, M.Sc. defense, Universite Pierre-et-Marie-Curie, France.
- 2015**
- Jul **Triality: a particularity of $Spin(8)$** , B.Sc. defense, Universitat Autònoma de Barcelona, Spain.

Professional Service

Conference Organization

AMS Sectional Meeting, United States.

- Spring Eastern 2024: *Quantum symmetries and tensor categories*
- Spring Eastern 2021: *Hopf algebras, tensor categories, and related homological methods*

Graduate Algebra Symposium, Texas.

- Spring 2021: University of Oklahoma
- 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

Committees

Equity, Diversity and Inclusion, University of California, Los Angeles.

- Member: 2021-present

Seminar Organization

Quantum Symmetries Seminar, Texas A&M University.

- Fall 2020
- Fall 2019

[†] Canceled or hosted online due to COVID-19.

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.

- 2020–2021: Organizer
- Fall 2019: Mentor
- Spring 2019: Mentor

Student Government

Math Grad Student Diversity Committee, Texas A&M University.

- 2020–2021: Co-Founder

AMS Chapter, Texas A&M University.

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

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

- 2018–2021: Mentor

Fulbright Student Association, Texas A&M University.

- 2017–2018: IT officer and Webmaster

Teaching

University of California, Los Angeles

Instructor.

- Winter 2023: Math 31B (Integration and Infinite Series)
- Summer 2022: Math 31B (Integration and Infinite Series)
- Summer 2022: Math 33A (Linear Algebra and Applications)
- Spring 2022: Math 115A (Linear Algebra)
- Winter 2022: Math 33A (Linear Algebra and Applications)
- Fall 2021: Math 110AH (Algebra (Honors))
- Fall 2021: Math 31B (Integration and Infinite Series)

Texas A&M University

Instructor.

- Summer 2021: Summer Educational Enrichment in Math
- 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

Undegraduate algebra and calculus, high school mathematics and physics.

- 2008–2015

Outreach and Service

Programs

Applied Mathematics Mentorship Program, UCLA Curtis Center for Mathematics & Teaching.

- Video series on Black and Latino/a mathematicians for K-12 schools.

California State University Math Summer Bridge Program, University of California, Los Angeles, and the California State Universities of Northridge, San Bernadino, and Los Angeles.

- 2021-present: Co-Organizer

Matching Mathematicians with Classrooms Nationwide, American Institute of Mathematics.

- 2021-2022: MATCH Fellow

Panel Discussions and Committees

Undergraduate Math Council Speaker Series, University of California, Los Angeles.

- Winter 2022: Invited speaker

Equity, Diversity and Inclusion Committee, University of California, Los Angeles.

- Fall 2021: Faculty member

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 2020: Speaker
- Fall 2019: Speaker
- Spring 2019: Speaker
- 2016–2021: 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