

# Pablo S. Ocal

## Curriculum Vitae

Okinawa Institute of Science and Technology  
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🌐 tensor.cat

### Employment

- 2024–present **Postdoctoral Scholar**, *Okinawa Institute of Science and Technology*, Japan  
Mentor: Liron Speyer
- 2021–2024 **Assistant Adjunct Professor**, *University of California, Los Angeles*, CA  
Mentor: Paul Balmer

### Visiting Positions

- Summer 2024 **Research Member**, *Quantum Symmetries Reunion*, Simons Laufer Mathematical Sciences Institute
- 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

- 9  $B_\infty$  **structures, monoidal categories, and singularity categories**, with B. Keller  
• Preprint
- 8 **Locally recoverable algebro-geometric codes with multiple recovery sets from projective bundles**, with K. Aguilar, A. Alvarez, R. Ardila, C. Rodriguez Avila, and A. Varilly-Alvarado  
• arXiv:2409.04201
- 7 **Universal support for triangulated categories**, with P. Balmer, *C. R. Math. Acad. Sci. Paris*, 2024  
• arXiv:2308.10815
- 6 **Symmetric monoidal equivalences of topological quantum field theories in dimension two and Frobenius algebras**, *Proc. Amer. Math. Soc.*, 2024  
• arXiv:2307.05309
- 5 **A compositional account of motifs, mechanisms, and dynamics in biochemical regulatory networks**, with R. Aduddell, J. Fairbanks, A. Kumar, E. Patterson, and B. T. Shapiro, *Compositionality*, 2024  
• arXiv:2301.01445
- 4 **A primer on twists in the noncommutative realm focusing on algebra, representation theory, and geometry**, with K. Ueyama and P. Veerapen, *Contemp. Math.*, 2024  
• arXiv:2211.15885

- 3 **A dichotomy between twisted tensor products of bialgebras and Frobenius algebras**, with A. Oswald, *J. Algebra*, 2024  
 • arXiv:2211.14754
- 2 **Homotopy liftings and Hochschild cohomology of some twisted tensor products**, with T. Oke and S. Witherspoon, *J. Algebra Appl.*, 2022  
 • 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

- 2024–2025 **Team-Up**, Pacific Institute for the Mathematical Sciences  
 • Project: Twisted tensor products of Hopf algebras
- 2024–2026 **AIM SQuaRE**, American Institute of Mathematics  
 • Project: Locally recoverable codes from the algebraic geometry of projective spaces
- 2024 **US Junior Oberwolfach Fellowship**, Mathematisches Forschungsinstitut Oberwolfach and National Science Foundation
- 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**, Fundación Mutua Madrileña, Spain
- 2012 **JAIE Intro**, Instituto de Ciencias Matematicas, Spain  
 • Program: Introduction to Ramsey Theory

## Advisees

- 2024–present **Rohan Das**, *PRIMES: Program for Research in Mathematics, Engineering and Science for High School Students*, Massachusetts Institute of Technology
- Summer 2023 **Kyan Agdassi**, Saint Francis High School

## Professional Service

### Conference Organization

#### **AMS Sectional Meeting**, United States

- Spring Eastern 2024: *Commutative and noncommutative algebra, together at last*
- Spring Eastern 2021: *Hopf algebras, tensor categories, and related homological methods*

#### **Graduate Algebra Symposium**, Texas-Oklahoma

- 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

- Spring 2021, Fall 2020, Spring 2019

## Committees

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

- Member: 2021–2024

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

- 2020–2021: Co-Founder

## Seminar Organization

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

- Spring 2021, 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**

- 2020–2021: 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

- 2018–2021: Mentor

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## Outreach and Service

### Programs

**Applied Mathematics Mentorship Program**, The UCLA Curtis Center

- 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 Long Beach, Los Angeles, Northridge, and San Bernadino

- 2021–2024: 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

- 2021–2024: 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 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

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## Selected Conference Talks

### 2024

Mar **A twisted approach to the Balmer spectrum of a Hopf algebra**, *Southeastern Lie Theory Workshop*, University of Virginia

Jan **Representations of algebras via universal supports**, *Joint Mathematics Meetings*, San Francisco

### 2023

Aug **A twisted approach to the Balmer spectrum of the stable module category of a Hopf algebra**, *Young Topologists Meeting*, Ecole Polytechnique Fédérale de Lausanne, Switzerland

May **Rewriting Zhang twists as twisted tensor products**, *AMS Spring Western Sectional Meeting*, California State University, Fresno

### 2022

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

† 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 Álgebra Homológica*, Universidad de Buenos Aires, Universidad Nacional de Mar del Plata, Universidad Nacional del Sur, Argentina

† 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

## Selected Seminar Talks

### 2024

- Feb **Quantum symmetries via twisted tensor products**, *Representation Theory Seminar*, Okinawa Institute of Science and Technology, Japan

### 2023

- Nov **Quantum symmetries via twisted tensor products and their Balmer spectrum**, *Algebra Seminar*, Indiana University Bloomington
- Oct **Quantum symmetries via twisted tensor products and their Balmer spectrum**, *Algebra Seminar*, University of Southern California
- Feb **A twisted approach to the Balmer spectrum of the stable module category of a Hopf algebra**, *Algebra Seminar*, University of California, San Diego

### 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 Algebraic Geometry Seminar*, University of Washington
- Oct **Hochschild cohomology of general twisted tensor products**, *Representation Theory and Related Topics Seminar*, Northeastern University
- Oct **Hochschild cohomology of general twisted tensor products**, *Algebra Seminar*, University of Oregon
- Apr **Structures in Hochschild cohomology**, *MSRI Online Seminar*, Mathematical Sciences Research Institute

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

## Teaching

### University of California, Los Angeles

#### **Instructor**

- Spring 2024: Math 31B (Integration and Infinite Series)
- Winter 2024: Math 31B (Integration and Infinite Series)
- Fall 2023: Math 33A (Linear Algebra and Applications)
- Spring 2023: Math 115A (Linear Algebra)
- 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