

MANUEL L. REYES

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ACADEMIC APPOINTMENTS

- 2020– University of California, Irvine
 Associate Professor of Mathematics, 2020–
 Affiliated Faculty, Logic and Philosophy of Science, 2024–
- 2011–20 Bowdoin College
 Associate Professor of Mathematics 2018–2020
 Assistant Professor of Mathematics 2011–2018
- 2010–11 University of California, San Diego: UC President’s Postdoctoral Fellow

EDUCATION

- 2010 University of California, Berkeley, Ph.D. Mathematics. Advisor: Tsit Yuen Lam.
 Dissertation: *One-sided prime ideals in noncommutative algebra*.
- 2005 Westmont College, B.S. Mathematics and Physics.
 Summa cum laude, Phi Kappa Phi.

RESEARCH INTERESTS

I explore interactions between the following topics, with particular attention to the border between commutative and noncommutative mathematics: ring and module theory, category theory, noncommutative geometry, algebraic geometry, operator algebras, and quantum physics.

PEER-REVIEWED PUBLICATIONS

23. Manuel L. Reyes, *Dual coalgebras of twisted tensor products*. Algebras and Representation Theory **28** (2025), no. 4, 1093–1123.
22. So Nakamura and Manuel L. Reyes, *Categories of hypermagmas, hypergroups, and related hyperstructures*. Journal of Algebra **676** (2025), 408–474.
21. Manuel Reyes, *A tour of noncommutative spectral theories*. Notices of the American Mathematical Society **72** (2025), no. 2, 145–153.
20. Manuel L. Reyes, *The finite dual coalgebra as a quantization of the maximal spectrum*. Journal of Algebra **644** (2024), 287–328.

19. Manuel L. Reyes and Daniel Rogalski, *Graded twisted Calabi-Yau algebras are generalized Artin-Schelter regular*. Nagoya Mathematical Journal **245** (2022), 100–153.
18. Manuel L. Reyes and Daniel Rogalski, *Growth of graded twisted Calabi-Yau algebras*. Journal of Algebra **539** (2019), 201–259.
17. Chris Heunen and Manuel L. Reyes, *Frobenius structures over Hilbert C^* -modules*. Communications in Mathematical Physics **361** (2018), no. 2, 787–824.
16. Zehra Bilgin, Manuel L. Reyes, and Ünsal Tekir, *On Right S -Noetherian rings and S -Noetherian modules*. Communications in Algebra **46** (2018), no. 2, 863–869.
15. Michael Ben-Zvi (Bowdoin '13), Alexander Ma (Bowdoin '16), and Manuel L. Reyes, *A Kochen-Specker theorem for integer matrices and noncommutative spectrum functors* (with an appendix by Alexandru Chirvasitu), Journal of Algebra **491** (2017), 280–313.
14. Chris Heunen and Manuel L. Reyes, *Discretization of C^* -algebras*. Journal of Operator Theory **77** (2017), no. 1, 19–37.
13. Manuel Reyes, Daniel Rogalski, and James J. Zhang, *Skew Calabi-Yau triangulated categories and Frobenius Ext-algebras*. Transactions of the American Mathematical Society **369** (2017), no. 1, 309–340.
12. Miodrag C. Iovanov, Zachary Mesyan, and Manuel L. Reyes, *Infinite-dimensional diagonalization and semisimplicity*. Israel Journal of Mathematics **215** (2016), no. 2, 801–855.
11. Manuel L. Reyes, *A prime ideal principle for two-sided ideals*. Communications in Algebra **44** (2016), no. 11, 4585–4608.
10. Manuel L. Reyes, Daniel Rogalski, and James J. Zhang, *Skew Calabi-Yau algebras and homological identities*. Advances in Mathematics **264** (2014), 308–354.
9. Chris Heunen, Tobias Fritz, and Manuel L. Reyes, *Quantum theory realizes all joint measurability graphs*. Physical Review A **89** (2014), no. 3, 0321201 (5 pages).
8. Chris Heunen and Manuel L. Reyes, *Active lattices determine AW^* -algebras*. Journal of Mathematical Analysis and Applications **416** (2014), no. 1, 289–313.
7. Manuel L. Reyes, *Sheaves that fail to represent matrix rings*, Ring Theory and Its Applications, Contemporary Mathematics **609**, pp. 285–297, Amer. Math. Soc., Providence, RI, 2014.
6. Chris Heunen and Manuel L. Reyes, *Diagonalizing matrices over AW^* -algebras*. Journal of Functional Analysis **264** (2013), no. 8, 1873–1898.
5. Manuel L. Reyes, *Obstructing extensions of the functor Spec to noncommutative rings*. Israel Journal of Mathematics **192** (2012), no. 2, 667–698.

4. Manuel L. Reyes, *Noncommutative generalizations of theorems of Cohen and Kaplansky*. Algebras and Representation Theory **15** (2012), no. 5, 933–975.
3. Manuel L. Reyes, *A one-sided Prime Ideal Principle for noncommutative rings*. Journal of Algebra and Its Applications **9** (2010), no. 6, 877–919.
2. T. Y. Lam and Manuel L. Reyes, *Oka and Ako ideal families in commutative rings*. Rings, Modules, and Representations, Contemporary Mathematics **480**, pp. 263–288, Amer. Math. Soc., Providence, RI, 2009.
1. T. Y. Lam and Manuel L. Reyes, *A Prime Ideal Principle in commutative algebra*. Journal of Algebra **319** (2008), no. 7, 3006–3027.

PREPRINTS

1. Ida Cortez, Camilo Morales, and Manuel L. Reyes, *Minimal ring extensions of the integers exhibiting Kochen-Specker contextuality*. Preprint available at arXiv:2211.13216 [math.NT].
2. Manuel L. Reyes and Daniel Rogalski, *The domain and prime properties for Koszul rings and algebras*. Preprint available at arXiv:2407.13119 [math.RA].

RESEARCH ACTIVITIES, GRANTS, AND AWARDS

- 2022-25 NSF award DMS-2201273, *Geometric insights in noncommutative algebra*, \$200,000.
- 2019 Participant in “Noncommutative surfaces and Artin’s conjecture” workshop at American Institute of Mathematics (San Jose, CA).
- 2014–18 NSF award DMS-1407152, *RUI: Noncommutative polynomial algebras and the foundations of noncommutative geometry*, \$127,514.
- 2013 Research Membership for “Noncommutative Algebraic Geometry and Representation Theory” program, Mathematical Sciences Research Institute (Berkeley, CA).
- 2012–14 AMS-Simons Travel Grant.
- 2010–11 University of California President’s Postdoctoral Fellowship.

SELECTED INVITED TALKS

- 2025 Noncommutative Geometry in NYC seminar (online), hosted by St. John’s University, *Searching for spectrum functors*.
- AMS 2025 Joint Mathematics Meetings (New Developments in Noncommutative Algebra session), Seattle, WA, *Generalizing (hyper)rings to include \mathbb{F}_1* .

- 2024 Poisson Geometry and Artin-Schelter Regular Algebras conference, Institute for Advanced Study in Mathematics, Hangzhou, China, *When is a Koszul algebra a domain?*
 AMS Fall 2024 Central Sectional Meeting (Homological and Combinatorial Methods in Noncommutative Algebra session), UT San Antonio, *When Koszul rings are domains or prime.*
 36th OSU-Denison Conference, Ohio State University, *When is a Koszul algebra a domain?*
- 2023 California State University, San Bernardino, *Adventures in the noncommutative world.*
 \mathbb{F}_1 world seminar, hosted online by Utah State University, *Categories of hypergroups and hyperstructures.*
 AMS Spring 2023 Western Sectional Meeting (Artin-Schelter Regular Algebras and Related Topics session), California State University, Fresno, *On the domain and prime properties for AS regular algebras.*
 Seattle Noncommutative Algebra Day, University of Washington, *Categories of hypergroups and hyperstructures.*
 Categories, Rings, and Modules—A conference in honor of Alberto Facchini, University of Padova, *Categories of hypergroups and hyperstructures.*
- 2022 AMS Fall 2022 Western Sectional Meeting (Geometry and Representation Theory of Quantum Algebras and Related Topics session), University of Utah, *A glimpse of the quantized spectrum.*
 MAA MathFest (Philadelphia, PA), AMS–MAA Joint Invited Address, *How noncommutative algebra points toward quantum geometry.*
 University of Washington, Recent Advances and New Directions in the Interplay of Noncommutative Algebra and Geometry conference, *Quantizing the maximal spectrum.*
 Center for Communications Research, La Jolla, colloquium, *What is the spectrum of a noncommutative ring?*
 Seattle Noncommutative Algebra Day (online), hosted by University of Washington, *Quantizing the maximal spectrum.* (Previously scheduled for AMS Joint Mathematics Meetings, in a special session that was cancelled due to Covid.)
- 2021 Online Noncommutative Algebra Seminar (ONCAS), hosted by St. Louis University, *Dual coalgebras as a quantized maximal spectrum.*
 University of California Riverside, Fractal Research Group Seminar, *Searching for noncommutative sets.*
 AMS Spring 2021 Central Sectional Meeting—formerly at the University of Cincinnati (Interactions between Representation Theory, Poisson Geometry, and Noncommutative Algebra section), *Dual coalgebras of twisted tensor products.*

- 2019 Fudan University, 2019 Noncommutative Algebraic Geometry Shanghai Workshop, *An invitation to twisted Calabi-Yau algebras*.
- Ohio State University, Noncommutative Geometry and Operator Algebras Seminar, *Toward a functorial quantum spectrum for noncommutative algebras*.
- 2018 San Francisco State University, AMS Fall 2018 Western Sectional Meeting (Homological Methods in Noncommutative Algebra and Geometry session), *Twisted Calabi-Yau algebras of dimension $d \leq 3$* .
- International Centre for Mathematical Sciences (Edinburgh), Combining Viewpoints in Quantum Theory conference, *Toward a functorial quantum spectrum for noncommutative algebras*.
- University of Graz, Conference on Rings and Factorizations, *Progress with the Prime Ideal Principle*.
- 2017 Temple University, Algebra Extravaganza! in honor of Ellen Kirkman and Martin Lorenz, *Toward a functorial quantum spectrum for noncommutative algebras*.
- Washington State University, AMS Spring 2017 Western Sectional Meeting (Noncommutative Algebraic Geometry and Related Topics session), *Twisted Calabi-Yau and Artin-Schelter regularity properties for locally finite algebras*.
- 2016 University of Denver, AMS Fall 2016 Western Sectional Meeting (Quantum Algebra session), *Quantum colorings of integer idempotent matrices*.
- Banff International Research Station, “Bridges between Noncommutative Algebra and Algebraic Geometry” conference, *Twisted Calabi-Yau and Artin-Schelter regularity properties for locally finite algebras*.
- 2015 University of Oxford, Oxford Advanced Seminar on Informatic Structures, *The spectrum problem for noncommutative rings and algebras*.
- University of Oxford, Mathematical Institute Algebra Seminar, *Diagonalizable algebras of operators on infinite-dimensional spaces*.
- University of California, San Diego, Algebra Seminar, *Diagonalizable algebras of operators on infinite-dimensional vector spaces*.
- Michigan State University, AMS Spring 2015 Central Sectional Meeting (Topics in Noncommutative Algebra and Algebraic Geometry session), *Skew Calabi-Yau triangulated categories and Frobenius Ext-algebras*.
- 2014 Wesleyan University, Mathematics Department Colloquium, *The spectrum problem for noncommutative rings and algebras*.
- Ohio State University, OSU-OU Ring Theory Seminar, *Diagonalizing matrices over large operator algebras*.

- 2013 Washington University, St. Louis, AMS Fall 2013 Central Sectional Meeting (Noncommutative Rings and Modules session), *Sheaves that fail to represent matrix rings*.
- “1 Decembrie 1918” University of Alba Iulia, Joint International Meeting of the American Mathematical Society and the Romanian Mathematical Society (Noncommutative Ring Theory and Applications session), *Skew Calabi-Yau algebras and homological identities*.
- University of Colorado at Boulder, AMS Spring 2013 Western Sectional Meeting (Associative Rings and Algebras session), *Diagonalizing matrices over AW^* -algebras*.

SELECTED MATHEMATICAL AND ACADEMIC ACTIVITIES

Peer-review referee: Algebra and Number Theory, American Mathematical Monthly, Bulletin of the Iranian Mathematical Society, Canadian Mathematical Bulletin, Communications in Algebra, Communications in Mathematical Physics, Frontiers of Mathematics in China, Fundamenta Mathematicae, Israel Journal of Mathematics, Journal of Algebra, Journal of Algebra and Its Applications, Journal of Pure and Applied Algebra, Linear Algebra and its Applications, Linear and Multilinear Algebra, Manuscripta Mathematica, Mathematische Zeitschrift, Proceedings of the American Mathematical Society, Quantum Physics and Logic (conference).

Associate editor for Communications in Algebra (since 2020)

- 2023– American Mathematical Society committee member: AMS-Simons Travel Grants
- 2019 Provided one-on-one mentoring to postdocs interested in working at liberal arts colleges in the Institutional Research and Academic Career Development Awards (IRACDA) national meeting at University of Michigan.
- 2018 Performed review for the GRE Mathematics subject exam.
- 2016 Organized special session titled “Noncommutative Ring Theory and Noncommutative Algebra” at the AMS Fall Eastern Sectional Meeting at Bowdoin College, September 24–25.
- Coordinated visit for a speaker in the Mathematics Department’s “Conversations about diversity in STEM education” lecture series.
- Bowdoin Science Experience: facilitated a two-day research experience in mathematics for three incoming first-year students.

SELECTED SERVICE AT UC IRVINE AND UC SYSTEM

- 2022– Faculty coordinator for Orange County MathCounts chapter competition.
- 2021–24 Board on Undergraduate Scholarships, Honors, and Financial Aid.
- Reviewer for President’s Postdoctoral Fellowship Program, mathematics panel (several times)

AWARDS, FELLOWSHIPS, AND SCHOLARSHIPS

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- 2007–10 Ford Foundation Predoctoral Fellowship.
- 2005–07 Chancellor’s Distinguished Fellowship, UC Berkeley.
- 2005 Mathematics Department graduate of the year, Westmont College.
Physics Department graduate of the year, Westmont College.
- 2004–05 NSF Computer Science, Engineering, and Mathematics Scholarship, Westmont College.
- 2004 Wheelon Scholarship, Westmont College Physics Department, Fall 2004.
- 2003 Westmont College Mathematics Department Leonhard Euler Outstanding Sophomore Award.
- 2002–04 American Physical Society Minority Scholar.
- 2001 George Bate Physics Scholarship, Westmont College Physics Department.
- 2001–05 Presidential Scholar, Westmont College.