Melody A.H. Molander

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EDUCATION	University of California, Santa Barbara **Ph.D. in Mathematics**	Fall 2019 - Spring 2025 (expected)
	University of Oklahoma **M.A. in Mathematics**	Fall 2014 - Spring 2017
	University of California, Davis **B.S. in Mathematics**	Fall 2010 - Spring 2014

PAPERS

3. **Skein Theory of Affine ADE Subfactor Planar Algebras**
Thesis, in preparation.

2. **Skein Theory of Affine A Subfactor Planar Algebras**
Preprint on arXiv. arxiv.org/abs/2410.05519

1. **A Determinant Formula of the Jones Polynomial for a Family of Braids**
with Derya Asaner, Sanjay Kumar, Andrew Pease, and Anup Poudel
Submitted. arxiv.org/abs/2408.13410

RESEARCH INTERESTS

Quantum algebra, low-dimensional topology, operator algebras, tensor categories, diagrammatic algebras, subfactors, knot theory, quantum groups, C*-algebras, quantum topology, representation theory

CURRENT RESEARCH PROJECTS

• **Nuclear Dimension of Crossed Products by Hilbert Bimodules over Commutative C*-algebras**
with Marzieh Forough, Zahra Hasanpour-Yakhdani, Ja A Jeong, Preeti Luthra, and Karen Strung
• **A Skein Theory for Nichols Hopf Algebras**
with Alex Bisnath, and Quinn Kolt

AWARDS

National Science Foundation Travel Grant ($2300)	2024
National Science Foundation Travel Grant ($1000)	2024
GSA Conference Travel Grant, UC Santa Barbara ($500)	2024
USTARS Distinguished Graduate Student Speaker in Topology ($200)	2024
National Science Foundation Travel Grant ($1350)	2023
Operator Algebra Mentor Network Grant ($500)	2023
Decolvenaere Research Accelerator Award, UCSB Graduate Division ($8000)	2023
Individualized Professional Skills (IPS) Grant, UC Santa Barbara ($1000)	2023
Math Department Graduate Fellowship, University of Oklahoma ($3000)	2015
Richard V. Andree Memorial Scholarship, University of Oklahoma ($2000)	2015
Yueh-Jing Lin Fund, UC Davis ($2500)	2013

MENTORSHIP

UCSB Directed Reading Program Mentor	December 2019 - June 2023
REU Graduate Mentor, UCSB	June 2022 - August 2022
Women in STEM Mentor, UCSB	September 2019 - June 2022

SERVICE

USTARS 2025 Conference Organizer Shadow	May 2024 - present
AWM Student Chapter at UCSB, Secretary	June 2023 - present
Directed Reading Program at UCSB Co-Organizer	December 2020 - July 2023
Graduate Quantum Algebra and Topology Seminar Co-Organizer, UCSB	July 2023 - January 2024
AWM Chapter at UCSB Founder and President	August 2022 - June 2023
Quantum Algebra and Topology Seminar Co-Organizer, UCSB	September 2021 - June 2022
Math Teacher's Circle - Oklahoma City Founder and Instructional Leader	April 2015 - June 2017

TALKS
***=INVITED**

*23. **Joint Mathematics Meetings**; Knots, 3-manifolds, and Their Invariants Special Session; Seattle Convention Center; Seattle, Washington
"A determinant formula of the Jones Polynomial for a family of braids"   January 2025

22. **Joint Mathematics Meetings**; Advances in Operator Algebras Special Session; Seattle Convention Center; Seattle, Washington
"Using Diagrams to Describe Quantum Symmetries and Subfactors"

January 2025

*21. **AMS Western Sectional Meeting**; Graphical Calculus in Representation Theory and Low-Dimensional Topology Special Session; University of California, Riverside; Riverside, California
"Index 4 Subfactor Planar Algebras and Their Corresponding Categories"

October 2024

20. **Quantum Groups and Representation Theory**; North Carolina State University, Raleigh, North Carolina
"Index 4 Subfactor Planar Algebras and their Corresponding Categories"

October 2024

*19. **Young Mathematicians in C* Algebras**; University of Glasgow; Glasgow, Scotland
"Using Diagrams to Describe Quantum Symmetries of Subfactors"

August 2024

*18. **Oberwolfach Seminar**; Classification of C*-Algebras and Dynamics Seminar; Oberwolfach Research Institute for Mathematics; Oberwolfach, Germany
"Nuclear Dimension of Cuntz-Pimsner Algebras of C*-Correspondences"

May 2024

17. **Banff International Research Station Workshop**; Skew Braces, Braids, and the Yang-Baxter Equation; Banff International Research Station; Banff, Canada
"Skein Theory of Subfactor Planar Algebras"

May 2024

*16. **USTARS Distinguished Graduate Student in Topology Speaker**; Underrepresented Students in Topology and Algebra Research Symposium; University of Iowa; Iowa City, Iowa
"Using Diagrams to Describe Quantum Symmetries of Subfactors"

April 2024

15. **Graduate Student Topology and Geometry Conference**; Michigan State University; East Lansing, Michigan
"Skein Theory for Index 4 Subfactor Planar Algebras"

April 2024

14. **Southeastern Lie Theory Workshop**; Quantum Structures in Lie Theory; University of Virginia; Charlottesville, Virginia
"Skein Theory for Index 4 Subfactor Planar Algebras"

March 2024

13. **Women in Mathematics in Southern California Symposium**; Pomona College; Claremont, California
"Using Diagrams to Describe Quantum Symmetries of Subfactors"

February 2024

*12. **Joint Mathematics Meetings**; Knots, Skein Modules, and Categorification Special Session; Moscone Center; San Francisco, California
"Skein Theory of Index 4 Subfactor Planar Algebras"

January 2024

*11. **Claremont Topology Seminar**; Pomona College; Claremont, California
"Skein Theory for Affine ADE Subfactor Planar Algebras"

November 2023

*10. **Twinned Conference on C*-Algebras and Tensor Categories**; Fields Institute; in person in Toronto, Canada; and International Centre for Mathematical Sciences; streamed live at Edinburgh, Scotland
"Skein Theory for Affine ADE Subfactor Planar Algebras"

November 2023

9. **Young Mathematicians in C*-Algebras**; KU Leuven; Leuven, Belgium
"Skein Theory of Subfactor Planar Algebras"

August 2023

8. **Great Plains Operator Theory Symposium**; The Ohio State University; Columbus, Ohio
"Skein Theory for Index 4 Subfactor Planar Algebras"

May 2023

7. **AMS Spring Western Sectional**; Algebraic Structures in Knot Theory Special Session; Fresno State University; Fresno, California
"Diagrammatic Presentations of Affine Type A Subfactor Planar Algebras of Index 4"

May 2023

6. **Moab Topology Conference**; Utah State University, Moab; Moab, Utah
"Skein Theory for Affine ADE Subfactor Planar Algebras"

May 2023

5. **Redbud Topology Conference**; University of Oklahoma; Norman, Oklahoma   March 2023
"Skein Theory of Affine Type A Subfactor Planar Algebras"

4. **Underrepresented Students in Topology and Algebra Symposium**;   March 2023
University of Washington, Seattle, Washington
"Diagrammatic Presentations of Index 4 Planar Algebras"

*3. **Quantum Groups Seminar**; On Zoom; Hosted by Université de Lille in Lille,   March 2023
France & University of Oslo in Oslo, Norway
"Skein Theory for Affine ADE Subfactor Planar Algebras"

2. **Tech Topology Conference**; Georgia Institute of Technology; Atlanta, Georgia   December 2022
"Diagrammatic Presentations of Index 4 Subfactor Planar Algebras"

1. **Topology Students Workshop**; Georgia Institute of Technology; Atlanta,   July 2022
Georgia
"Diagrammatic Presentations of Affine Type A Subfactor Planar Algebras of Index 4"

TEACHING	**Lead TA - UC Santa Barbara** Provided professional development and training to new math department TAs	Fall 2022 - Spring 2023
	Teaching Assistant - UC Santa Barbara MATH 108AB - Introduction to Linear Algebra MATH 8 - Transition to Higher Mathematics MATH 6A - Vector Calculus I MATH 6B - Vector Calculus II MATH 34B - Calculus for Social and Life Sciences	Fall 2019 - present
	Associate Instructor - UC Santa Barbara MATH 6A - Vector Calculus I MATH 4A - Linear Algebra with Applications	Summer 2020, 2021, 2024
	Adjunct Mathematics Professor - Cosumnes River College MATH 30 - Pre-Algebra STAT 300 - Introduction to Statistics and Probability MATH 20 - Arithmetic	Spring 2018 - Spring 2019
	Teaching Assistant - University of Oklahoma MATH 1743 - Business Calculus I MATH 1914 - Calculus 1 (Fast Track) MATH 2924 - Calculus 2 (Fast Track) MATH 1823 - Calculus 1	Fall 2015 - Spring 2017
	Instructor of Record - University of Oklahoma MATH 1823 - Calculus 1 MATH 1503 - College Algebra	Fall 2014 - Summer 2015 & 2016
WORKSHOPS	**Oberwolfach Research Institute for Mathematics (MFO)** Classification of C*-Algebras and Dynamics Seminar	May 2024
	Banff International Research Station (BIRS) Skew Braces, Braids, and the Yang-Baxter Equation Workshop	May 2024
	American Institute of Mathematics (AIM) Quantum Invariants and Low-dimensional Topology	August 2023
	Banff International Research Station (BIRS) Women in Operator Algebras 3	June 2023