

# Lara M. Ismert

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## RESEARCH INTERESTS

Operator Algebras, Functional Analysis, Noncommutative Geometry, and applications to Quantum Mechanics, Quantum Information, and Topological Insulators.

## POSITIONS HELD

**Research Assistant Professor**, University of New Mexico June 2026–Present  
Albuquerque, New Mexico USA

**Postdoctoral Fellow**, University of New Mexico June 2025–June 2026  
Albuquerque, New Mexico USA

**Assistant Professor of Mathematics**, Embry-Riddle Aeronautical University Aug 2019–Jan 2025  
Prescott, Arizona USA

**Graduate Teaching Assistant**, University of Nebraska Aug 2013–May 2019  
Lincoln, Nebraska USA

## EDUCATION

**Certificate in Quantum Computing, Erdős Institute:** [Certificate] [Projects] July 2025

**University of Nebraska**, Lincoln, Nebraska USA

Ph.D. in Mathematics May 2019

Dissertation Title: *Unbounded Derivations of  $C^*$ -algebras and the Heisenberg Commutation Relation*

Advisors: Allan Donsig and David Pitts

M.S. in Mathematics May 2015

**Pittsburg State University**, Pittsburg, Kansas USA

B.S. in Mathematics, Magna Cum Laude May 2013

B.A. in English, Magna Cum Laude May 2013

## GRANTS & FELLOWSHIPS

**NSF DMS-2514264 Collaborative: Conference:** Co-PI. Groundwork for Operator Algebras Lecture Series (\$49,992) *The 2027 iteration will be at University of Montana, Missoula, MT.* 2026-27

**NSF DMS-2514263 Collaborative: Conference:** Co-PI. Groundwork for Operator Algebras Lecture Series (\$50,000) *The 2026 iteration will be at Michigan State University, East Lansing, MI.* 2026-27

**NSF DMS-2603107 Analysis Program:** PI. KMS States of Quantum Cuntz–Krieger Algebras 2023-26 (\$159,926) (originally NSF DMS-2247587 prior to transfer)

**NSF DMS-2247796 Conference:** Co-PI. Groundwork for Operator Algebras Lecture Series 2023 (\$50,000) *This iteration was held at Purdue University, West Lafayette, IN.*

**Postdoctoral Research Leave Fellowship**, Association of American University Women (AAUW) 2022-23 (\$30,000) *This fellowship’s purpose is to assist the candidate in obtaining tenure and further promotions by enabling them to spend a year pursuing independent research.*

**Faculty Innovative Research in Science & Technology (FIRST) Grant:** Co-PI. 2022-23 (\$12,500) *Funded four undergraduate student researchers to collaborate on co-led project (with M. Hamidi) entitled “Classification of quantum edge correspondences for quantum graphs over  $M_2(\mathbb{C})$ .”* Article in preparation.

**NSF DMS-2154557 Conference:** PI. Young Mathematicians in  $C^*$ -algebras 2022 at Univ. Oslo 2022  
 (\$49,895) *Travel funding for 20 US-based participants to travel to Oslo for YMC\*A 2022*

**Arizona Space Grant Consortium Grant:** PI, co-adviser 2020-21  
 (\$4,000) *Funded two undergraduate student researchers, culminated in publication*

#### RESEARCH ARTICLES

1. L. Huang & L. Ismert. *The Infinitesimal Covariant Stone-von Neumann Theorem*. (In preparation)
2. L. Ismert. *Cuntz algebras arising from dephasing channels as local quantum Cuntz–Krieger algebras*. (In preparation)
3. A. Cerjan, L. Ismert, T. Loring. *A new lower bound for uncertainty of three observables*. (In preparation)
4. M. Hamidi, L. Ismert, and B.A. Nelson. *Simplicity of Cuntz–Pimsner algebras for quantum graphs*. **Bulletin of the London Mathematical Society** 58 Issue 5 (2026), e70354.
5. Anna Duwenig, Kari Eifler, Priyanga Ganesan, Lara Ismert, Viviana Meschitti, Sarah Plosker & Karen Strung, *The Operator Algebras Mentor Network: Impact of Community-Based Mentoring*. **Journal of Humanistic Mathematics** 15 Issue 1 (2025), 334-354.
6. M. Brannan, M. Hamidi, L. Ismert, B.A. Nelson, and M. Wasilewski. *Quantum edge correspondences and quantum Cuntz–Krieger algebras*. **Journal of the London Mathematical Society** 107 Issue 3 (2022), 886-913 .
7. L. Huang and L. Ismert. *The Covariant Stone-von Neumann Theorem for Actions of Abelian Groups on  $C^*$ -Algebras of Compact Operators*. **Communications in Mathematical Physics** 378 (2020), 117-147.
8. L. Ismert. *Analyticity and kernel stabilization of unbounded derivations on  $C^*$ -algebras*. **New York Journal of Mathematics** 25 (2019), 914-933.
9. L. Ismert. *Unbounded Derivations of  $C^*$ -Algebras and the Heisenberg Commutation Relation*. **ETD collection for University of Nebraska – Lincoln**, (2019).

#### UNDERGRADUATE RESEARCH & ONLINE TEXTBOOKS

1. M. Hamidi, L. Ismert, and B. Solie. *Discrete Mathematics with Applications to Probability, Statistics, and Linear Algebra*. **Eagle Pubs** (2024, December 13).
2. E. Babcock, D. Brindle, M. Hamidi, and L. Ismert. *Matricial Frameworks for the Mandelbrot and Julia Sets*. **Ball State University Undergraduate Mathematics Exchange**, Vol. 17, No.1 (2023).

#### TRAVEL & COLLABORATION AWARDS

**Collaborate@ICERM:** *QECCs from constituent codes of quasi-cyclic codes*, Brown U., RI Jun 16-20, 2025  
 (Travel & accommodations) Joint w/ A. Álvarez, M. Hamidi, G. Terra Bastos, and C. Williams

**AIM SQuaRE:** to work on *Non-local games with memory*. Pasadena, CA 2025-2027  
 (Travel & accommodations for three week-long visits) Joint w/ I. Todorov, J. Crann, L. Gao, and L. Turowska.

**Mentoring Travel Grant**, NSF / Association for Women in Mathematics 2021-22  
 (\$4,000) *Travel funding to visit and collaborate with Michael Brannan twice at University of Waterloo*.

**Faculty Research Development Program**, ERAU-Prescott 2022  
 (\$950) *Travel funding to attend JMM 2022 in Seattle, WA (declined)*

**Faculty Research Development Program**, ERAU-Prescott 2020  
 (\$1338) *Funded travel and accommodations to present two invited presentations at the 2020 Joint Math Meeting in Denver, Colorado*.

## CONFERENCES, WORKSHOPS, & SEMINARS ORGANIZED

**BIRS Workshop: Applications of Operator Algebras and Noncommutative Geometry to Quantum Materials** @ Banff International Research Station, Banff, Alberta Apr 11-16, 2027

**University of New Mexico Analysis Seminar** Fall 2025, Fall 2026

**AMS Special Session:** Advances in Operator Algebras, Fall Western Sectional @ Arizona St. Nov 7-8, 2026

**Workshop on MASAs, Nest Algebras, and Free Semigroup Algebras** @ U Nebraska Jul 15-16, 2026  
In honor of David Pitts's career and contributions to the field.

**Groundwork for Operator Algebras Lecture Series 2026** @ Michigan State U June 21-Jul 3, 2026  
Co-PI, NSF DMS-2514263 and daily lecturer for C\*-algebras curriculum. *This program will provide graduate students with an introduction to operator algebras through mini-courses, problem sessions, and expository talks.*

**Noncommutative Topology and Quantum Materials**, Albuquerque, NM Mar 11-13, 2026  
*This small workshop brought together operator algebraists and physicists to discuss the spectral localizer.*

**Groundwork for Operator Algebras Lecture Series 2025**, Virtual Jun 23-Jul 18, 2025

**AMS Special Session:** Quantum Theory and Operator Algebras, Spring Midwest Sectional Mar 28-30, 2024

**Groundwork for Operator Algebras Lecture Series 2024** @ IPAM-UCLA Jul 15-26, 2024  
Co-PI and daily lecturer for C\*-algebras curriculum.

**ASUERAU C\*-Seminar** Aug 2021 - May 2024

**Groundwork for Operator Algebras Lecture Series 2023** @ Purdue University Jun 5-17, 2023  
Co-PI, NSF DMS 2247796 and daily lecturer for C\*-algebras curriculum.

**Young Mathematicians in C\*-algebras 2022** @ University of Oslo, Norway Aug 8-12, 2022  
PI, NSF DMS 2154557

**AMS Special Session on Advances in Operator Algebras, JMM 2022** Jan 7-8, 2022

**Operator Algebras Mentor Network - Diversity, Equity & Inclusion Training** Aug 10, 2021

**Operator Algebras Mentor Network - Abstract Writing Workshop** Jun 16, 2021

**Operator Algebras Mentor Network - CV Critique Workshop** Jun 2, 2021

**AMS Special Session on Advances in Operator Algebras, JMM 2021** Jan 7, 2021

**Young Mathematicians in C\*-algebras 2019** @ University of Copenhagen, Denmark Aug 5-10, 2019

**Operator Theory Reading Seminar - University of Nebraska** Spring 2018

## HONORS & AWARDS

**Linda Bors Fellowship**, University of Nebraska 2018  
(\$1000) *Selection based on scholarship of graduate students in the Department of Mathematics.*

**Special Projects Grant Program**, University of Nebraska 2017  
(\$1,000) *Selected semi-annually to promote professional development and networking opportunities for graduate students at the University of Nebraska. Funds covered travel and accommodation for Dr. Kay Kirkpatrick to*

give a STEM-wide colloquium in Lincoln, NE and also have a catered lunch with fifty students in STEM.

**Walter Mientka Teaching Award**, University of Nebraska 2016  
(\$500) *Awarded annually to one math graduate student for outstanding teaching.*

**Steven Haataja Award**, University of Nebraska 2016  
*Annual peer vote for best talk given in the math department's Graduate Student Seminar.*

#### INVITED LECTURES & TALKS

|                                                                                                   |                 |
|---------------------------------------------------------------------------------------------------|-----------------|
| LundSeaG - Workshop on Noncommutative Geometry, University of Lund, Sweden                        | June 7-11, 2027 |
| AMS Special Session on Advances in Operator Algebras, JMM 2027, Chicago, IL                       | Jan 2027        |
| Workshop on Noncommutative Geometry, University of Hawai'i at Manoa, HI                           | Nov 27-29, 2026 |
| Institut Mittag-Leffler Semester on Operator Algebras and Quantum Information, Sweden             | May 18-22, 2026 |
| Arizona State University C*-Seminar, Arizona State University, Tempe, AZ                          | April 16, 2026  |
| West Coast Operator Algebras Symposium, Pomona College, Pomona, CA                                | Dec 6-7, 2025   |
| New Mexico State University Colloquium, Las Cruces, NM                                            | Oct 24, 2025    |
| New Mexico State University Analysis Seminar, Las Cruces, NM                                      | Oct 24, 2025    |
| Arizona State University C*-Seminar, Arizona State University, Tempe, AZ                          | Oct 3, 2025     |
| COSy / NSeaG 2025 - Operator Algebras Mentor Network Talk & Panel                                 | May 28, 2025    |
| Noncommutative Geometry Seminar, Texas A&M University, College Station, TX                        | Apr 16, 2025    |
| Brazos Analysis Seminar, Baylor University, Waco, TX                                              | Apr 12-13, 2025 |
| BIRS Workshop on Operator Systems and their Applications, Banff, Alberta                          | Feb 5, 2025     |
| Joint Math Meetings 2025 AWM Special Session on Operator Algebras                                 | Jan 11, 2025    |
| Fields Institute - Mini-course lecturer on Actions of Tensor Categories on C*-algebras (declined) | Nov 2023        |
| Fields Institute - Plenary talk on Actions of Tensor Categories on C*-algebras (declined)         | Nov 7, 2023     |
| Nebraska-Iowa Functional Analysis Seminar, U. Nebraska, Lincoln, NE                               | Mar 25, 2023    |
| Purdue University Operator Algebras Seminar (Virtual)                                             | Jan 31, 2023    |
| AMS Special Session on Advances in Operator Algebras, JMM 2023, Boston, MA                        | Jan 7, 2023     |
| MSRI Special Session on Dynamics and Operator Algebras, JMM 2023, Boston, MA                      | Jan 6, 2023     |
| East Coast Operator Algebras Symposium, Michigan State U., Lansing, MI                            | Oct 23, 2022    |
| Michigan State U. Math Physics and Operator Algebra Seminar, Lansing, MI                          | Sep 13, 2022    |
| Noncommutative Geometry and Operator Algebras Seminar, University of Wollongong (Virtual)         | Mar 2, 2022     |
| Analysis Seminar, University of Waterloo, Waterloo, Ontario                                       | Dec 8, 2021     |
| Brazos Analysis Seminar Fall 2021 (Virtual)                                                       | Nov 14, 2021    |
| Groundwork for Operator Algebras Lecture Series, Michigan State University, Lansing, MI           | Jul 23, 2021    |
| IPAM - Workshop on Actions of Tensor Categories on C*-algebras (Virtual)                          | Jan 27, 2021    |
| Michigan State Math Physics and Operator Algebras Seminar (Virtual)                               | Nov 30, 2020    |
| Prague Noncommutative Geometry & Topology Seminar (Virtual)                                       | Nov 10, 2020    |
| Arizona State University C*-Seminar (Virtual)                                                     | Sep 16, 2020    |
| AMS Special Session on C*-algebras, Dynamical Systems, JMM 2020, Denver, CO                       | Jan 17, 2020    |
| AMS Special Session on Advances in Operator Algebras, JMM 2020, Denver, CO                        | Jan 16, 2020    |
| AMS Fall Sectional Meeting: Advances in Operator Algebras, UC Riverside, CA                       | Nov 10, 2019    |
| Vanderbilt University Subfactor Seminar, Nashville, TN                                            | Apr 12, 2019    |
| University of Texas at Tyler Mathematics Colloquium, Tyler, TX                                    | Mar 3, 2019     |
| MAA Special Session on EDGE for Women, JMM 2019, Baltimore, MD                                    | Jan 17, 2019    |
| AMS Fall Sectional: Special Session on Noncommutative Geometry, San Fran State U, CA              | Oct 27, 2018    |
| Brazos Analysis Seminar, Texas A&M University, College Station, TX                                | Sep 29, 2018    |
| Young Mathematicians in C*-algebras, Katholieke Universiteit te Leuven, Belgium                   | Aug 14, 2018    |
| AMS Special Session on Advances in Operator Algebras, JMM 2018, San Diego, CA                     | Jan 12, 2018    |
| Iowa-Nebraska Functional Analysis Seminar, University of Iowa, Des Moines, IA                     | Nov 11, 2017    |

#### LOCAL SEMINAR TALKS

**University of New Mexico Analysis Seminar** *The Covariant Stone-von Neumann Theorem, Part I* Aug 29, 2025

**ASUERAU C\*-Seminar***Unbounded derivations on  $B(H)$* 

Nov 2, 2022

*Quantum graphs and their infinite path spaces*

Aug 31, 2022

*A Covariant Stone-von Neumann Theorem*

Sep 16, 2020

**UNL Operator Algebras Seminar***One-Parameter Semigroups, Infinitesimal Generators, and their Analytic Vectors*, 2 talks

Fall 2018

*A Reflexive Representation for  $n$ -times Weakly  $D$ -Differentiable Operators*, 2 talks

Spring 2017

*On Weakly  $D$ -Differentiable Operators*, 2 talks

Fall 2016

*Characterization of the Extreme Points in the Closed Unit Ball of a  $C^*$ -algebra*

Spring 2015

**UNL Graduate Student Seminar***The Mathematics Behind Quantum Mechanics*

Fall 2015

*The Frobenius-Pierce Theorem: Finite-Dimensional Real Division Algebras*

Spring 2014

**UNL Operator Theory Reading Seminar***Motivation for Studying Hilbert  $C^*$ -modules*

Spring 2018

*Completely Positive Maps*

Fall 2017

*The GNS Construction for a  $C^*$ -algebra*, 2 talks

Fall 2015

*Operator-Valued Measures and von Neumann's Interpretation of Quantum Mechanics*

Spring 2015

*Hilbert Space Formulation of Quantum Mechanics and the Postulates*

Spring 2015

*The Simplicity of the Cuntz Algebra*, 2 talks

Fall 2014

*Weiner's Theorem: Inverse of a Function with Absolutely Convergent Fourier Series*

Spring 2014

*Classification of the Maximal Ideal space of the Disk Algebra*

Spring 2014

**OTHER CONFERENCES ATTENDED (THOSE NOT LISTED UNDER INVITED TALKS)****Canadian Operator Theory Symposium** (Virtual)

Jun 1, 2021

**Zagreb Workshop on Operator Theory** (Virtual)

Jun 30, 2020

**Mastery Grading Conference**, (Virtual) masterygrading.com

Jun 5-6, 2020

**Canadian Operator Symposium**, (Virtual) The Fields Institute, Ontario, Canada

May 25-29, 2020

**Nebraska-Iowa Functional Analysis Seminar**, Lincoln, Nebraska

Nov 2-3, 2018

**Young Mathematicians in  $C^*$ -algebras**, University of Copenhagen, Denmark

Aug 7-11, 2017

**Young Women in  $C^*$ -algebras**, University of Copenhagen, Denmark

Aug 5-6, 2017

**Great Plains Operator Theory Symposium**, Texas Christian Univ., Fort Worth, TX

May 22-26, 2017

**Iowa-Nebraska Functional Analysis Seminar**, University of Iowa, Iowa City, IA

Nov 5, 2016

**Great Plains Operator Theory Symposium**, University of Illinois, Champaign, Illinois

May 23-27, 2016

**AMS Spring Central Sectional Meeting**, North Dakota State University, Bismarck, ND

April 16-17, 2016

**Rocky Mountain Mathematics Consortium**, University of Wyoming, Laramie, WY

Jun 1-5, 2015

**Iowa-Nebraska Functional Analysis Seminar**, University of Iowa, Iowa City, IA

April 19, 2014

**TEACHING EXPERIENCE****Instructor of Record at Embry-Riddle Aeronautical University**MA 399: *Complex Variables* (Sp '20)MA 399: *Introduction to Quantum Information Theory* (Sp '22)MA 345: *Differential Equations & Matrix Methods* (1 section Sp '22, 2 sections Sp '24)MA 335: *Linear Algebra I* (1 section Sp '24)MA 243: *Calculus & Analytic Geometry III* (1 section F '20)MA 242: *Calculus & Analytic Geometry II* (2 sections Sp '20, 2 sections Sp '21)MA 241: *Calculus & Analytic Geometry I* (3 sections Fa '19)MA 225: *Introduction to Discrete Structures* (3 sections F '21, 2 sections Sp '22, 1 section Sp '23)

### Instructor of Record at University of Nebraska

|                                                                                        |                          |
|----------------------------------------------------------------------------------------|--------------------------|
| MATH 800T: <i>Mathematics as a Second Language for Middle Level Teachers</i> *         | Summer 2016              |
| MATH 314: <i>Linear Algebra</i>                                                        | Spring 2019              |
| MATH 310: <i>Introduction to Modern Algebra</i> (intro to proof writing & ring theory) | Summer 2018              |
| MATH 208: <i>Calculus III</i> (multivariable/vector calculus)                          | Spring 2018, Fall 2017   |
| MATH 203: <i>Contemporary Mathematics</i>                                              | Spring 2016, Summer 2014 |
| MATH 106: <i>Calculus I</i>                                                            | Summer 2017              |
| MATH 103: <i>College Algebra and Trigonometry</i>                                      | Fall 2016                |
| MATH 101: <i>College Algebra</i>                                                       | Fall 2015, Fall 2014     |
| MATH 100A: <i>Intermediate Algebra</i>                                                 | Spring 2015              |

\*Co-instructor: taught lessons, facilitated groupwork activities, and graded student work

### Teaching Assistant at University of Nebraska

|                                   |             |
|-----------------------------------|-------------|
| MATH 208: <i>Calculus III</i>     | Fall 2018   |
| MATH 107: <i>Calculus II</i>      | Fall 2013   |
| MATH 106: <i>Calculus I</i>       | Spring 2014 |
| MATH 104: <i>Applied Calculus</i> | Fall 2018   |

### Grader at University of Nebraska

|                                                                    |             |
|--------------------------------------------------------------------|-------------|
| MATH 922: <i>Real Analysis II</i> (graduate measure theory)        | Spring 2015 |
| MATH 872: <i>General Topology II</i> (graduate algebraic topology) | Spring 2018 |

### CURRICULUM DEVELOPMENT

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|---------------------------------------------------------------------------------------------------|-------------|
| <b>Author</b> , Discrete Structures and Applied Linear Algebra - Open Education Resource Textbook | 2023-24     |
| <b>Author</b> , Course-wide College Algebra Lesson Plans                                          | Summer 2016 |
| <b>Programmer</b> , Course-wide College Algebra WeBWorK Problems & Hints                          | Summer 2015 |

### SERVICE & OUTREACH

#### Co-founder, Operator Algebras Mentor Network

*OAMN is a mentoring network for early-career underrepresented gendered operator algebraists. I conceptualized group mentor structure to benefit graduate students and young postdocs and invited a wide array of mathematicians to serve as junior and senior mentors. I organized and led meetings and workshops in conjunction with COSy 2020, JMM 2021, COSy 2021, Operator Algebra Summer School 2021, and YMC\*A 2021; and planned the first annual Mentor Training on Diversity, Equity, & Inclusion in Aug 2021.*

**Mentor, Operator Algebras Mentor Network** 2020-Present

**Treasurer, Operator Algebras Mentor Network** 2022-23

*Established OAMN as a US non-profit status to be able to receive tax-deductible donations*

**Creator & Supervisor, Math Tutor Center, ERAU-Prescott** 2021-Present

**Chair, Nominating & Elections Committee, Faculty Senate ERAU-Prescott** 2021-22

**Member, Institutional Effectiveness Committee, Faculty Senate ERAU-Prescott** 2020-21

**Board Member, Operator Algebras Mentor Network** 2019-21

**Diversity & Inclusion Coordinator, College of Arts & Sciences, ERAU-Prescott** 2020 - present

*In this inaugural role, I am tasked with providing vision, leadership, coordination, and planning for diversity and inclusive excellence in my college. As the college's de facto diversity leader, I maintain strong working relationships among the dean, department chairs, faculty, students, staff and external constituents.*

**Member, Chancellor's Retention Committee, ERAU-Prescott** 2020  
*Review data on retention of ERAU students by demographics and degree programs. Brainstorm methods and support faculty can provide to students to improve retention.*

**Secretary/Treasurer, American Mathematical Society Graduate Chapter** 2017–18  
*Distributed travel funding to graduate students in the department of mathematics at the University of Nebraska and organized a colloquium for esteemed researcher Dr. Kay Kirkpatrick.*

**Invited Panelist**, Nebraska Conference for Undergraduate Women in Math 2017

**Technology Volunteer**, Nebraska Conference for Undergraduate Women in Math 2014–18

**Campuswide Workshop for Graduate Teaching Assistants, University of Nebraska**  
 Invited Member, Workshop Planning Committee 2017  
 Invited Panelist, Math and Statistics Breakout Session 2014

**Camp Counselor, All Girls/All Math Summer** Jul 2016  
*Week-long summer program for thirty high school girls from across the country. I stayed in the dorms, chaperoned all academic and extracurricular activities, and tutored girls' modular arithmetic sessions in the evenings.*

**Moderator, Nebraska Math Day Quiz Bowl** 2014–18  
*Volunteered annually to moderate several rounds of Math Day Quiz Bowl, where 1,500 high school students from across Nebraska compete for honorary title and prize money.*