Dr. Christine Ruey Shan Lee

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Assistant Professor
Mathematics
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Education

PHD, Michigan State University, 2015.
Major: Mathematics

BS, California Inst of Technology, 2007.
Major: Mathematics

Awards and Honors

Research Excellence, TXST math department. (November 2025 - December 2025).

Teaching Excellence. (December 2024).

Research Excellence. (December 8, 2023).

Publications

Lee, C. R. S. (2025). Computing Khovanov homology via categorified Jones-Wenzl projectors. *Contemporary Mathematics Issue on Algebraic Structures in Knot Theory*, *827*, 32--48.

Lee, C. R. S. (published). Stable Khovanov homology and volume. *Proceedings of the American Mathematical Society*, 2219--2234.

Kalfagianni, E., & Lee, C. R. S. (published). Jones diameter and crossing number of knots. *Advances in Mathematics*, *417*, N/A. https://doi.org/10.1016/j.aim.2023.108937

Lee, C. R. S., & van der Veen, R. (2022). Colored Jones polynomials without tails. *Algebraic and Geometric Topology*, *22*(6), 2857–2865.

Lee, C. R. S. (2022). Jones slopes and coarse volume of near-alternating links. *Communications in Analysis and Geometry*, *30*(4), 891–948.

Lee, C. R. S., & van der Veen, R. (2021). Cancellations in the degree of the colored Jones polynomial. *Vietnam*, *46*, 321–345.

Caprau, C., Gonzalez, N., Lee, C. R. S., Lowrance, A., Sazdanovic, R., & Zhang, M. (2021). On Khovanov Homology and Related Invariants. *Association for Women in Mathematics Series*, *27*. https://doi.org/https:// doi.org/ 10.1007/ 978-3-030-80979-9 6

Lee, C. R. S., & Vafaee, F. (2021). On 3-braids and L-space knots. *Geometriae Dedicata*. Published. https://doi.org/DOI 10.1007/s10711-020-00594-8

Hubbard, D., & Lee, C. R. S. (2020). Stability and Triviality of the Transverse Invariant from Khovanov Homology. *Topology and Its Applications*. Published. https://doi.org/DOI:10.1016/j.topol.2020.107146

Garoufalidis, S., Lee, C. R. S., & van der Veen, R. (2020). The Slope Conjecture for Montesinos knots. *International Journal of Mathematics*. Published. https://doi.org/DOI: 10.1142/S0129167X20500561

Lee, C. R. S. (2019). Stability properties of the colored Jones polynomial. *Journal of Knot Theory and Its Ramifications*, *28*(8).

Lee, C. R. S. (2018). A trivial tail homology for non A-adequate links. *Algebraic and Geometric Topology*, *18*(3), 1481–1513.

Kalfagianni, E., & Lee, C. R. S. (2018). Normal and Jones surfaces of knots. *Journal of Knot Theory and Its Ramifications*, *27*(6).

Kalfagianni, E., & Lee, C. R. S. (2016). Crosscap numbers and the Jones polynomial. *Advances in Mathematics*, *286*, 308–337.

Kalfagianni, E., & Lee, C. R. S. (2014). On the degree of the colored Jones polynomial. *Acta Mathematica Vietnamica*, *39*, 549–560.

Lee, C. R. S., & van der Veen, R. (2014). Slopes for pretzel knots. *New York Journal of Mathematics*, 1339–1364.

Presentations

Lee, C. R. S., Richmond Geometry Meeting, "A Topological model for the HOMFLY-PT polynomial," Virginia Commonwealth University, Richmond, VA. (September 2025).

Lee, C. R. S., Stanford Topology Seminar, "A Topological model for the HOMFLY-PT polynomial," Stanford University, Stanford, CA. (February 2025).

Lee, C. R. S., UC Santa Barbara Topology Seminar, "A Topological model for the HOMFLY-PT polynomial," UC Santa Barbara, Santa Barbara, CA. (February 2025).

Lee, C. R. S., AMS Special Session on Heegaard Splittings of 3-manifolds and Trisections of 4-manifolds, Joint Mathematics Meeting, "A Topological model for the HOMFLY-PT polynomial," American Mathematical Society, Seattle, WA. (January 2025).

Lee, C. R. S., Michigan State University Topology Seminar, "A Topological model for the HOMFLY-PT polynomial," Michigan State University, East Lansing, MI. (December 2024).

Lee, C. R. S., 50th Knots in Washington, "A Topological model for the HOMFLY-PT polynomial," George Washington University, Washington DC. (2024).

Lee, C. R. S., Rice University Topology Seminar, "A Topological model for the HOMFLY-PT polynomial," Rice University, Houston, TX. (2024).

Lee, C. R. S., Hodgsonfest, "A Topological model for the HOMFLY-PT polynomial," University of Melbourne, Melbourne. (November 2024).

Lee, C. R. S., Texas Geometry Topology Conference 2024, "A Topological model for the HOMFLY-PT polynomial," Texas A & M, Houston, TX. (November 2024).

Lee, C. R. S., Braids Reunion, "A Topological model for the HOMFLY-PT polynomial," ICERM, Providence, RI. (July 2024).

Lee, C. R. S., University of Leeds Algebra Seminar, "A Topological model for the HOMFLY-PT polynomial," University of Leeds, Leeds, United Kingdom. (June 2024).

Lee, C. R. S., Groningen Quantum Topology Dag, "A Topological Model for the HOMFLY-PT polynomial," University of Groningen, Groningen, Netherlands. (May 2024).

Lee, C. R. S., Columbia Topology Seminar, "Stable Khovanov homology and volume," Columbia University, New York, United States. (November 2023).

Lee, C. R. S., AMS spring western sectional meeting, "Stable Khovanov homology and volume," California State University, Fresno, California State University, Fresno, Fresno, CA, United States. (May 2023).

Lee, C. R. S., ICERM ``Tangled in Knot Theory" Workshop, "Stable Khovanov homology and volume," ICERM, ICERM, Providence, RI, United States. (May 2023).

Lee, C. R. S., Moduli and Friends seminar, "Stable Khovanov homology and volume," Virtual, Romania. (May 2023).

Lee, C. R. S., University of Hamburg seminar, "Stable Khovanov homology and volume," University of Hamburg, Virtual, Hamburg, Germany. (May 2023).

Lee, C. R. S., AMS spring central sectional meeting, "Stable Khovanov homology and volume," The University of Cincinnati, The University of Cincinnati, Cincinnati, OH, United States. (April 2023).

Lee, C. R. S., AMS Spring Southeastern sectional meeting, "Stable Khovanov homology and volume," Georgia Tech, Georgia Tech, Atlanta, GA, United States. (March 2023).

Lee, C. R. S., Low-dimensional Topology and Circle-valued Morse Functions, "Stable Khovanov homology and volume," Institute of the Mathematical Sciences of the Americas, Institute of the Mathematical Sciences of the Americas, Miami, FL, United States. (February 2023).

Contract, Fellowships, Grants and Sponsored Research

Lee, C. R. S., "CAREER: COLORED LINK HOMOLOGIES AND THE GEOMETRIC TOPOLOGY OF SURFACES IN LOW-DIMENSIONS," Sponsored by National Science Foundation, Federal, $466,294.00. (September 2025 - September 2030).

Lee, C. R. S. (Principal), "IPAM-UCLA senior fellowship," Sponsored by Institute of Pure and Applied Mathematics, Institutional (Higher Ed), $8,900.00. (September 2026 - December 2026).

Bhattacharya, P. (Principal), Tanaka, H. L. (Co-Principal), Lee, C. R. S. (Co-Principal), Bobkova, I., "South Central Topology Conference III," Sponsored by National Science Foundation, Federal, $20,000.00. (September 1, 2023 - August 31, 2024).

Bobkova, I. (Principal), Tanaka, H. (Co-Principal), Xu, G. (Co-Principal), Lee, C. R. S. (Co-Principal), "South Central Topology Conference II," Sponsored by National Science Foundation, Federal, $22,519.00. (January 2023 - December 2023).

Lee, C. R. S., Caprau, C., Gonzalez, N., Sazdanovic, R., Zhang, M., "Topological Applications of Khovanov Homology," Sponsored by American Institute of Mathematics, Other. (2021 - 2023).

Lee, C. R. S., "Surfaces and the geometry and topology of quantum link invariants," Sponsored by National Science Foundation, Federal, $109,708.00. (September 2023).

Teaching Experience

MATH 4330, section 251, GENERAL TOPOLOGY. 3.00 credit hours.

MATH 4330, section 001, GENERAL TOPOLOGY. 3.00 credit hours. 25 enrolled.

MATH 7301, section 003, STUDIES IN MATH. 3.00 credit hours. 1 enrolled.

MATH 7319, section 001, TOPOLOGY II. 3.00 credit hours. 5 enrolled.

MATH 2471, section 255, CALCULUS I. 4.00 credit hours. 43 enrolled.

MATH 2471, section L55, CALCULUS I. 0.00 credit hours. 43 enrolled.

MATH 5329, section 251, GENERAL TOPOLOGY. 3.00 credit hours. 4 enrolled.

MATH 7309, section 251, TOPOLOGY I. 3.00 credit hours. 1 enrolled.

MATH 2471, section 004, CALCULUS I. 4.00 credit hours. 47 enrolled.

MATH 2471, section L04, CALCULUS I. 0.00 credit hours. 47 enrolled.

MATH 4330, section 001, GENERAL TOPOLOGY. 3.00 credit hours. 26 enrolled.

MATH 2472, section 259, CALCULUS II. 4.00 credit hours. 32 enrolled.

MATH 2472, section 261, CALCULUS II. 4.00 credit hours. 35 enrolled.

MATH 2472, section L09, CALCULUS II. 0.00 credit hours. 32 enrolled.

MATH 2472, section L11, CALCULUS II. 0.00 credit hours. 35 enrolled.

MATH 2472, section 005, CALCULUS II. 4.00 credit hours. 43 enrolled.

MATH 2472, section 006, CALCULUS II. 4.00 credit hours. 42 enrolled.

MATH 2472, section L05, CALCULUS II. 0.00 credit hours. 43 enrolled.

MATH 2472, section L06, CALCULUS II. 0.00 credit hours. 42 enrolled.

MATH 2471, section 252, CALCULUS I. 4.00 credit hours. 38 enrolled.

MATH 2471, section L52, CALCULUS I. 0.00 credit hours. 38 enrolled.

MATH 2471, section 008, CALCULUS I. 4.00 credit hours. 30 enrolled.

MATH 2471, section 010, CALCULUS I. 4.00 credit hours. 26 enrolled.

MATH 2471, section L08, CALCULUS I. 0.00 credit hours. 30 enrolled.

MATH 2471, section L10, CALCULUS I. 0.00 credit hours. 26 enrolled.

Teaching Innovation and Curriculum Development

New Course. Topology and artificial neural networks. January 2023 - Present.

University Service

Organizer, Machine Learning Reading Seminar. (January 2024 - Present).

Curriculum Committee member, Curriculum Committee. (September 2025 - May 2026).

Organizer, Topology Seminar. (August 2024 - May 2026).

Grad Expo Speaker, 2026 Grad Expo. (December 2025).

Member, Library committee. (September 2022 - May 2025).

Member, University Lecturers Committee. (January 24, 2024 - March 15, 2025).

Member, PhD Proposal Committee. (May 2023 - January 2025).

University Mentor, Mathworks. (June 2024 - July 2024).

Judge for the MAA sectional undergraduate presentations, The 103rd Annual Section Meeting of the MAA. (March 2024).

Participant, Grad school panel. (December 2023).

Participant, Math Tea. (October 2023).

Presenter, Grad Expo. (September 2023 - October 24, 2023).

Grad Expo. (October 20, 2023).

Participant, STEP-UP workshop. (May 2023).

Grad Expo. (November 4, 2022).

Professional Service

Reviewer / Referee, Gasglow Mathematical Journal. (September 2025 - December 2025).

Reviewer / Referee, Mathematical Research letters. (September 2025 - November 2025).

Proceedings of the Edinburgh Mathematical Society. (May 2024 - January 2025).

Reviewer / Referee, Proceedings of the Edinburgh Mathematical Society. (June 2024 - August 2024).

Reviewer / Referee, National Science Foundation panel for the division of Mathematics and topology. (April 2024).

Reviewer / Referee, The Proceedings of the American Mathematical Society. (October 2023 - December 2023).

Reviewer / Referee, New York Journal of Mathematics. (January 2023 - May 2023).

Coordinator / Organizer, South Central Topology Conference, San Marcos, TX. (February 2023).

Reviewer / Referee, Bulletin of the London Mathematical Society. (September 2022 - November 2022).

Reviewer / Referee, National Science Foundation panel for the division of Mathematics and topology. (March 2022).

Public Service

Volunteer, Association for Women in Mathematics. (January 2025 - May 2025).

Volunteer, Association for Women in Mathematics. (February 2022 - May 2025).

Provided media, Scientific American. (October 2024 - April 2025).

Volunteer, Girls Talk Math. (July 2024).

Volunteer, St. Bernard Preparatory School, Cullman, AL. (January 15, 2024 - March 7, 2024).