

Academic Appointment

2024 - present Associate professor, University of Nebraska Omaha
2018 - 2024 Assistant professor, University of Nebraska Omaha
2015 - 2018 CIRGET postdoctoral fellow, McGill University and UQAM, Montréal, Canada

Visiting Position

2018 Spring Department of Mathematics, University of Georgia, Athens, GA

Education

08/2015 Ph.D. in Mathematics, Louisiana State University, U.S.
05/2010 M.S. in Mathematics, Louisiana State University, U.S.
06/2008 B.S. in Math & Applied Math, Beijing Normal University, Beijing, China

RESEARCH

Research Interests

- Foliations, contact structures, and flows on 3-manifolds
- Group actions on dimension-1 spaces and orderability of 3-manifold groups
- Knots, links and braids
- Mapping class groups and dynamics on surfaces

Grants

2024 - 2027 PI, NSF grant DMS-2409398
2021 - 2023 Co-PI, University of Nebraska Collaboration Initiative Grant
with S. Ryu (PI), Mechanical and Materials Engineering (UNL),
S. Kim (Co-PI), Civil and Environmental Engineering (UNL)
Fall 2020 University of Nebraska Online Course Development Grant

Publications and preprints

1. (with S. Boyer and C. Gordon) Cyclic branched covers of Seifert links and properties related to the ADE link conjecture, 54 pgs, 2024, submitted. preprint: <https://arxiv.org/abs/2402.15914>
2. (with S. Boyer and C. Gordon) Recalibrating \mathbb{R} -order trees and $\text{Homeo}_+(S^1)$ -Representations of link groups, 43 pgs, 2023, submitted. preprint: <https://arxiv.org/abs/2306.10357>
3. (with S. Boyer and C. Gordon) Slope detection and toroidal 3-manifolds, 60 pgs, 2021, submitted. preprint: <https://arxiv.org/abs/2106.14378>
4. (with S. Boyer and C. Gordon) JSJ decompositions of knot exteriors, Dehn surgery and the L-space conjecture, 25 pgs, 2023, Selecta Mathematica, to appear preprint: <https://arxiv.org/abs/2307.06815>
5. (with J. Baldwin and S. Sivek) Khovanov homology and the cinquefoil, 21 pgs, 2021, Journal of the European Mathematical Society, to appear preprint: <https://arxiv.org/abs/2105.12102>

6. *Euler class of taut foliations and Dehn filling*, 25 pgs, 2019,
Communications in Analysis and Geometry, 31 (2023), no. 7, 1749-1782.
preprint: <https://arxiv.org/abs/1912.01645>.
7. (with S. Boyer) *Taut foliations in branched cyclic covers and left-orderable groups*,
Transactions of the American Mathematical Society, 372 (2019), no. 11, 7921 - 7957.
preprint: <https://arxiv.org/abs/1711.04578v3>
8. *Left-orderability and cyclic branched coverings*,
Algebraic & Geometric Topology 15 (2015), no. 1, 399-413.
preprint: <https://arxiv.org/abs/1311.3291>

Recent Invited Talks

- Joint Topology Seminar, Tongji University and East China Normal University, Shanghai, August 2024.
- Mini Course, Shanghai Center For Mathematical Sciences, Fudan University, Shanghai, August 2024.
- St. Louis Topology Conference, Saint Louis, May 2024.
- Spring Reddub Topology Conference, Oklahoma State University, April 2024.
- Topology seminar, East China Normal University, Shanghai (Online), December 2023.
- Groups Semigroups Topology seminar, University of Nebraska-Lincoln, November 2023.
- Geometric Topology seminar, Columbia University, New York, November 2023.
- Geometric Topology seminar, Boston College, Boston, November 2023.
- Geometry and Topology seminar, Brown University, Providence, October 2023.
- "Progress in low dimensional topology", the AWM Research Symposium, Atlanta, September 2023.
- Jiu Zhang Mathematical Forum, Lanzhou University, Lanzhou, August 2023.
- Topology seminar, Department of Mathematics, Peking University, Beijing, June 2023.
- Topology seminar, Morningside Mathematics Center, Chinese Academy of Sciences, Beijing, June 2023.
- Topology seminar, Yau Mathematical Sciences Center, Tsinghua University, Beijing, June 2023.
- CIRGET Topology working group, UQAM, Montreal, May 2023.
- Geometry and Topology Seminar, Louisiana State University, April, 2023.
- AWM Research Symposium at The University of Minnesota, June 2022.
- Topology and Geometry Seminar, Rutgers University - New Brunswick, March 2022.
- The 55th Annual Spring Topology and Dynamical Systems Conference, Waco, TX, March 2022.
- Groups Semigroups and Topology Seminar, University of Nebraska, Lincoln, December 2021.
- Canadian Mathematical Society Summer Meeting, June 2021.
- Geometry and Topology Seminar, Washington University in St. Louis, April 2021.
- Geometry and Topology Online Seminar, Warwick, UK, December 2020.
- Nearly Carbon Neutral Geometric Topology Conference, online, June 2020.
- Topology Seminar, University of Iowa, Iowa city, February 2020.
- Groups Semigroups and Topology Seminar, University of Nebraska, Lincoln, December 2019.
- Geometry and Topology Seminar, Washington University in St. Louis, October 2019.
- Conference "Phenomenon of Codimension 1 in Topology in Low Dimensions", CRM50 Thematic Program in Low-Dimensional Topology, Montreal, September 2019.
- BIRS-CMO Conference "Ordered Groups and Rigidity in Dynamics and Topology", June 2019
- Conference "Georgia Topology Conference", Athens, Georgia, May 2019
- GEAR/GGD seminar, University of Illinois Urbana-Champaign, February 2019

TEACHING AND MENTORING

Master Students Mentoring

- Bradley Horner, *Accidental Isomorphisms*, MA, UNO, Spring 2024.
- Jacob Gruber, in progress, MA, UNO,

Undergraduate Mentoring

- Noyce Teacher Scholarship Program, UNO (Fall 2024)
Mentee: Nathan Walter
- Downey Scholars (2023 - 2024)
Mentees: McCartney Fitzgerald, Brandon Lao, Natalie Mcnamara, Madyson Self
- UN Collaboration Grant Project, with Sangjin Ryu (UNL) and Seunghee Kim (UNL), (2021 - 2023)
Mentee: Jacob White
Research project: In vitro models of insect wing vein networks for studying insect blood circulation
Publication: (with S. Ryu, S. Kim, J. White, H. Zhang), Geometric analysis of insect wing vein network, Proceedings of the ASME 2022 Fluids Engineering Division Summer Meeting.
- UNO Course Mentoring Program (Fall 2021)
Mentee: Cole Long
- Kerrigan Undergraduate Research Program, UNO (Summer 2019)
Mentee: Gage Hoefer
Research project: Visualizing hyperbolic structures on the once punctured torus.
- Noyce Teacher Scholarship Program, UNO (Spring 2019)
Mentee: Valeria Loza

Teaching Workshops/Conferences

- *IBL workshop*, Academy of Inquiry-based Learning, June 2019.
- *National Council of Teachers of Mathematics Regional Conference and Exposition*, Kansas City, November 2018
- *Teaching Techniques for Instructors Workshop*, McGill University, September 2017.
- *Learning to Teach Day*, McGill University, November 2016.

Teaching Experience

University of Nebraska Omaha

- Applied Topology (Spring 2021)
- Introduction to Abstract Mathematics (Spring 2022)
- Introduction to Analysis (Fall 2019 - 2024)
- Advanced Linear Algebra (Spring 2020 - 2024)
- Calculus I (Fall 2018 - 2024)
- Calculus II (Spring 2019 - 2020, 2022 - 2023)

McGill University

- Calculus I (Fall 2015 - 2017)

Louisiana State University

- Calculus I (Summer 2013)
- Co-instructor of Calculus recitations (Fall 2012, Fall 2013)
- Pre-Calculus (Fall 2011)
- Trigonometry (Spring 2010, Spring 2014)
- College Algebra (Fall 2010)

PROFESSIONAL SERVICES

Conferences/workshops Organized

- Co-organizer of the workshop "Computational questions about 3-manifolds, associated groups and varieties" Rutgers - Newark, October, 2025.
- Co-organizer of the special session "Foliations, flows and groups" at the AMS Fall Central Section Meeting, Creighton University, October 7-8, 2023.
- Co-organizer of the session "Foliations, flows, and dynamics in 3-manifolds" at the NCNGT Conference, June 14-25, 2021.
- Co-organizer of the special session "Developments in Knot Theory and Low-dimensional Topology" at the AMS Fall Central Section Meeting, Creighton University, October 9-10, 2021.
- Co-organizer of "CIRGET working group in Low dimensional topology," Spring 2016, Fall 2017
- Co-organizer of the special session "Geometric group theory and topology in low dimensions" at Canadian Mathematics Society Winter Meeting, Niagara Falls, 2016.

Referee Request Journal List

- Advances in Mathematics
- Algebraic Geometric Topology
- Journal of the London Mathematical Society
- Journal of Knot Theory and its Ramifications
- Proceedings of the American Mathematical Society
- Transactions of the American Mathematical Society

Department/University Services

- 2024 - present, Member of the Educational Policy Advisory Committee, UNO
- 2018 - 2023, 2024 - present, Member of the Upper Curriculum Committee, Department of Mathematical and Statistical Sciences, UNO
- 2023 - 2024, Member of the Core Curriculum Committee, Department of Mathematical and Statistical Sciences, UNO

OTHER SKILLS

Program and Computational Software

Python, C++, Mathematica, SnapPy, Sage, MATLAB

Languages

Proficient in Chinese and English; Working knowledge in French