Rylee Alanza Lyman

Contact	Department of Mathematics and Computer Science *E-mail:* rylee.alanza@gmail.com

Contact   Department of Mathematics and Computer Science   *E-mail:* `rylee.alanza@gmail.com`
Smilth Hall, Rutgers University at Newark   *Mobile:* 952.465.6895
Newark, NJ 07102   *Webpage:* `https://ryleealanza.org`

Research Interests   Geometric group theory, geometric topology, outer automorphism groups, mapping class groups, Coxeter groups, deformation spaces of group actions, hyperbolic and CAT(0) geometry.

Appointments

Rutgers University at Newark, Assistant Professor   2024
Rutgers University at Newark, Postdoctoral Associate, NSF Postdoctoral Fellow   2020–2024

Education

Tufts University, PhD in Mathematics (Advisor: Kim Ruane)   May 2020
Tufts University, MS in Mathematics   May 2017
Columbia University, BA in Mathematics (honors) & Music, *cum laude*   May 2015

Research

Étale Groupoids and Mapping Class Groups of Orbifolds and Graphs of Groups
In preparation. (with Tyrone Ghaswala)

Exponential Dehn Functions for Deformation Groups of Free Splittings
In preparation. (with Lee Mosher)

Conformal Dimension for Coxeter group boundaries
In preparation. (with E. Field, R. Gupta and E. Stark)

One-Endedness of Outer Automorphism Groups of Free Products of Finite and Cyclic Groups
Submitted.
Available at arXiv:2305.04986 [Math.GR]

A Family of CAT(0) Outer Automorphism Groups of Free Products
Submitted.
Available at arXiv:2209.04711 [Math.GR]

On Whitehead's Cut Vertex Lemma
J. Group Theory.
Available at arXiv:2205.06071 [Math.GR]

Lipschitz Metric Isometries Between Outer Spaces of Virtually Free Groups
Illinois J. Math. **67(2)** (2023), 409–422
Available at arXiv:2203.09008 [Math.GR]

CTs for Free Products
Submitted.
Available at arXiv:2203.08868 [Math.GR]

Train Track Maps on Graphs of Groups
Groups Geom. Dyn. **16(4)** (2022), 1389–1422
Available at arXiv:2102.02848 [Math.GR]

Extensions of Hyperbolic Groups Have Locally Uniform Exponential Growth
Submitted. (with Robert Kropholler and Thomas Ng)
Available at arXiv:2012.14880 [Math.GR]

Folding-like Techniques for CAT(0) Cube Complexes
Math. Proc. Camb. Philos. Soc. **173(1)** (2022), 227–238
(with Michael Ben-Zvi and Robert Kropholler)
Available at arXiv:2011.05374 [Math.GR]

Some New CAT(0) Free-by-Cyclic Groups
Mich. Math. J. **73** (2023) 621–630
Available at: arXiv:1909.03097 [Math.GR]

Nielsen Realization for Infinite-Type Surfaces
Proc. Amer. Math. Soc. **149** (2021), 1791–1799 (with S. Afton, D. Calegari and L. Chen)
Available at arXiv:2002.09760 [Math.GT]

Train Tracks on Graphs of Groups and Outer Automorphisms of Hyperbolic Groups
PhD thesis. Available at arXiv:2005.00164 [Math.GR]

Talks

Joint Mathematics Meetings   Jan 2024
Geometric group theory, San Francisco, CA

Topology Seminar   Nov 2023
  Rice University
Groups, Logic and Dynamics Meeting   Oct 2023
  Rutgers University at New Brunswick
Algebra and Cryptology Center Seminar   Oct 2023
  Stevens Institute of Technology
AIM Workshop   Oct 2023
  Rigidity properties of free-by-cyclic groups, American Institute of Mathematics
AWM Research Symposium   Sep 2023
  Women in Groups, Geometry and Dynamics, Clark University
Diverse Aspects of Groups, Geometry and Dynamics   Sep 2023
  Heidelberg University
Special Session, CMS Summer Meeting   Jun 2023
  Geometric Topology, pseudo-Anosov Maps, and Complex Dynamics, University of Ottawa
Geometry of Subgroups   May 2023
  Centre de Recherches Mathématiques, Montréal
Special Session, AMS Sectional Meeting   Apr 2023
  Ends and Boundaries of Groups, University of Cincinnati
Redbud Topology Conference   Mar 2023
  University of Oklahoma
Special Session, AMS Sectional Meeting   Mar 2023
  Geometric Group Theory, Georgia Institute of Technology
Topology and Group Theory Seminar   Mar 2023
  Vanderbilt University
Topology Seminar   Mar 2023
  Princeton University
Young Geometric Group Theory XI   Feb 2023
  Westfälische Wilhelms-Universität Münster
Mathematics Colloquium   Dec 2022
  Rutgers University at Newark
Geometry & Topology Seminar   Sep 2022
  City University of New York
Wasatch Topology Conference   Aug 2022
  University of Utah, Brigham Young University
Big Mapping Class Groups at BC   Aug 2022
  Boston College
Mathematics Colloquium   May 2022
  State University of New York at Albany
Joint Mathematics Meetings   Mar 2022
  Topics and Generalizations in Geometric Group Theory, Seattle
  Low-Dimensional Manifolds, Seattle
Special Session, AMS Sectional Meeting   Mar 2022
  Subgroups in Nonpositive Curvature, Tufts University
Spring Topology and Dynamical Systems Conference   Mar 2022
  Baylor University
Tetrahedral Geometry/Topology Seminar   Mar 2022
  West Chester University
Joint Geometry & Topology Seminar   Nov 2021
  Bowling Green State University, University of Toledo
Geometry & Topology Seminar   Nov 2021
  Temple University
Mathematics & Statistics Colloquium   Nov 2021
  Swarthmore College
North British Geometric Group Theory Seminar   Nov 2021
  Newcastle University
Bi-College Math/Stat Colloquium   Oct 2021
  Haverford College

World of Geometric Group Theory	Aug 2021
Groups and Geometry in the South East	June 2021
Oxford University	
Nearly Carbon Neutral Geometric Topology	June 2021
Dynamics and Group Geometry Early Researchers Seminar	May 2021
Warwick University	
Geometric Group Theory and Topology Seminar	Mar 2021
Tufts University	
MAXIMALS Algebra, Geometry and Topology Seminar	Mar 2021
Heriot-Watt University	
Geometry and Topology Seminar	Feb 2021
Bristol University	
Geometry and Topology Seminar	Feb 2021
Yale University	
Random and Arithmetic Structures in Topology Seminar	Dec 2020
Mathematical Sciences Research Institute	
Geometry and Topology Seminar	Nov 2020
City University of New York	
Geometry and Topology Seminar	Oct 2020
Binghamton University	
Pure Math Seminar	Oct 2020
University of North Carolina–Greensboro	
Big Surf(aces) Seminar	Oct 2020
Mathematics Colloquium	Sep 2020
Rutgers University–Newark	
Geometric Group Theory without Boundaries	July 2020
Mini-course on Bass–Serre Theory	
Trends in Low-Dimensional Topology	June 2020
Geometry and Topology Online	June 2020
Warwick Mathematics Institute	
Topology Seminar	May 2020
University of California Riverside	
Geometric Topology Seminar	Apr 2020
Columbia University	
Topology Seminar	Mar 2020
University of Wisconsin at Milwaukee	
Pick My Brain Seminar	Feb 2020
Northeastern University	
Geometric Group Theory Seminar	Jan 2020
McGill University	
Hyperbolic Lunch	Jan 2020
University of Toronto	
Dynamics, Geometry and Groups Seminar	Jan 2020
Queens University	
Boston Topology Seminar	Jan 2020
Brandeis University	
Special Session, AMS Sectional Meeting	Oct 2019
Effective and Quantitative Advances in Low Dimensional Topology and Geometric Group Theory, Binghamton University	
Algebra/Topology Seminar	Oct 2019
State University of New York at Albany	
Graduate Seminar	Sep 2019
Temple University	
Geometry and Topology Seminar	Sep 2019
Temple University	
LG&TBQ	June 2019
University of Michigan	

	Graduate Student Conference in Algebra, Geometry and Topology	June 2019
	Temple University	
	Spring Topology and Dynamical Systems Conference	Mar 2019
	University of Alabama at Birmingham	
	Geometric Group Theory and Topology Seminar	Nov 2018
	Tufts University	
	Eminar Tufts Student Seminar, *6 talks*	2017–2019
CONFERENCE PARTICIPATION	**Semester Program in Geometric Group Theory**	Feb–Jun 2023
	Centre de Recherches Mathématiques, Montréal	
	Nearly Carbon Neutral Geometric Topology	Sep 2022
	Communicating Mathematics	Aug 2022
	Cornell University	
	Geometry, Arithmetic and Groups	Jun 2022
	Lightning Talk, University of Texas at Austin	
	Sage Days Duluth	Jun 2022
	Lightning Talk, University of Minnesota at Duluth	
	YGGT X	July 2021
	Lightning Talk, Newcastle University	
	Artin Groups, CAT(0) Geometry and Related Topics	July 2021
	The Ohio State University	
	ParaDIGMS Spring Conference	April 2021
	AMS, IMSI	
	Tech Topology Conference	Dec 2020
	Lightning Talk, Georgia Institute of Technology	
	RTG Mini-Conference	Feb 2020
	University of Utah	
	Tech Topology Conference	Dec 2019
	Lightning Talk, Georgia Institute of Technology	
	Algorithms in Complex Dynamics and Mapping Class Groups	Nov 2019
	ICERM, Brown University	
	Junior Geometry and Topology in the Midwest	Oct 2019
	University of Wisconsin at Madison	
	Wasatch Topology Conference	Aug 2019
	University of Utah, Brigham Young University	
	Aspects of Geometric Group Theory	July 2019
	Institut des Hautes Études Scientifiques	
	Young Geometric Group Theory VIII	July 2019
	Lightning Talk, Colegio Mayor Miguel de Unamuno	
	Spring Opportunities Workshop	Apr 2019
	American Institute of Mathematics	
	Graduate Student Topology and Geometry Conference	Mar 2019
	Lightning Talk, University of Illinois at Urbana-Champaign	
	Junior Geometry and Topology in the Midwest	Oct 2018
	University of Wisconsin at Madison	
	Women and Mathematics Program	May 2016
	Institute for Advanced Study	
OUTREACH	Panelist, "US-Based Jobs Panel," YGGT X	July 2021
	Co-organizer, Geometric Group Theory Without Boundaries Summer School	July 2021
	Participant, ParaDIGMS Diversity in Graduate Mathematical Sciences conference	Apr 2021
	Panelist, "Gender in Mathematics" Rutgers University	Mar 2021
	Co-organizer, Geometric Group Theory Without Boundaries Summer School	July 2020
	Co-organizer, Tufts Directed Reading Program	AY 2018–20
	Mentor, Tufts Directed Reading Program	Fall 2019
	Mentor, Tufts Directed Reading Program	Summer 2016

TEACHING	**Rutgers University**	
	Calculus II	Spring 2022
	Calculus II	Fall 2021
	Basic Linear Algebra	Fall 2021
	Calculus II	Spring 2021
	Topology	Fall 2020
	Tufts University	
	Co-organizer, Graduate Development Seminar	Spring 2020
	Co-organizer, Graduate Development Seminar	Fall 2019
	Math of Social Choice	Summer 2019
	Math of Social Choice	Spring 2019
AWARDS	Robert P. Guertin Student Leadership Award finalist	2020
	Head Teaching Assistant	AY 2019–20
SERVICE	Referee work for *Groups, Geom. Dyn., New York J. Math.,*	
	Proc. Amer. Math. Soc., J. London Math. Soc., Rev. Mat. Iberoam., Topology Proceedings	
	Reviewing work for zbMath, MathSciNet	
	Organizer, Geometric Group Theory Reading Seminar	AY 2019–20
	Treasurer, Tufts Organization of Graduate Students in Mathematics	AY 2018–19
	Mathematics Department Graduate Union Steward	AY 2017–19
	Mathematics Department Representative, Tufts Graduate Student Council	AY 2017–18
	Graduate Student Member, Tufts Committee on Curricula	AY 2017–18
OTHER	**Languages:** English (native), German (intermediate), Japanese (intermediate)	
	Citizenship: United States of America	