

# RYLEE ALANZA LYMAN

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| CONTACT            | Department of Mathematics and Computer Science<br>Smilth Hall, Rutgers University at Newark<br>Newark, NJ 07102   | <i>E-mail:</i> rylee.alanza@gmail.com<br><i>Mobile:</i> 952.465.6895<br><i>Webpage:</i> <a href="https://ryleealanza.org">https://ryleealanza.org</a> |
| 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       | <b>Rutgers University at Newark</b> , Assistant Professor   | 2024  |
|                    | <b>Rutgers University at Newark</b> , Postdoctoral Associate, NSF Postdoctoral Fellow   | 2020–2024   |
| EDUCATION          | <b>Tufts University</b> , PhD in Mathematics (Advisor: Kim Ruane)   | May 2020  |
|                    | <b>Tufts University</b> , MS in Mathematics   | May 2017  |
|                    | <b>Columbia University</b> , BA in Mathematics (honors) & Music, <i>cum laude</i>   | May 2015  |
| RESEARCH           | <b>Étale Groupoids and Mapping Class Groups of Orbifolds and Graphs of Groups</b><br><i>In preparation.</i> (with Tyrone Ghaswala)  |   |
|                    | <b>Exponential Dehn Functions for Deformation Groups of Free Splittings</b><br><i>In preparation.</i> (with Lee Mosher)   |   |
|                    | <b>Conformal Dimension for Coxeter group boundaries</b><br><i>In preparation.</i> (with E. Field, R. Gupta and E. Stark)  |   |
|                    | <b>One-Endedness of Outer Automorphism Groups of Free Products of Finite and Cyclic Groups</b><br><i>Submitted.</i><br>Available at arXiv:2305.04986 [Math.GR]  |   |
|                    | <b>A Family of CAT(0) Outer Automorphism Groups of Free Products</b><br><i>Submitted.</i><br>Available at arXiv:2209.04711 [Math.GR]  |   |
|                    | <b>On Whitehead’s Cut Vertex Lemma</b><br><i>J. Group Theory.</i><br>Available at arXiv:2205.06071 [Math.GR]  |   |
|                    | <b>Lipschitz Metric Isometries Between Outer Spaces of Virtually Free Groups</b><br><i>Illinois J. Math.</i> <b>67</b> (2) (2023), 409–422<br>Available at arXiv:2203.09008 [Math.GR]                                       |   |
|                    | <b>CTs for Free Products</b><br><i>Submitted.</i><br>Available at arXiv:2203.08868 [Math.GR]  |   |
|                    | <b>Train Track Maps on Graphs of Groups</b><br><i>Groups Geom. Dyn.</i> <b>16</b> (4) (2022), 1389–1422<br>Available at arXiv:2102.02848 [Math.GR]  |   |
|                    | <b>Extensions of Hyperbolic Groups Have Locally Uniform Exponential Growth</b><br><i>Submitted.</i> (with Robert Kropholler and Thomas Ng)<br>Available at arXiv:2012.14880 [Math.GR]                                       |   |
|                    | <b>Folding-like Techniques for CAT(0) Cube Complexes</b><br><i>Math. Proc. Camb. Philos. Soc.</i> <b>173</b> (1) (2022), 227–238<br>(with Michael Ben-Zvi and Robert Kropholler)<br>Available at arXiv:2011.05374 [Math.GR] |   |
|                    | <b>Some New CAT(0) Free-by-Cyclic Groups</b><br><i>Mich. Math. J.</i> <b>73</b> (2023) 621–630<br>Available at: arXiv:1909.03097 [Math.GR]  |   |
|                    | <b>Nielsen Realization for Infinite-Type Surfaces</b><br><i>Proc. Amer. Math. Soc.</i> <b>149</b> (2021), 1791–1799 (with S. Afton, D. Calegari and L. Chen)<br>Available at arXiv:2002.09760 [Math.GT]                     |   |
|                    | <b>Train Tracks on Graphs of Groups and Outer Automorphisms of Hyperbolic Groups</b><br><i>PhD thesis.</i> Available at arXiv:2005.00164 [Math.GR]  |   |
| TALKS              | <b>Special Session, CMS Summer Meeting</b><br><i>Geometric Topology, pseudo-Anosov Maps, and Complex Dynamics</i> , University of Ottawa  | Jun 2023  |

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| <b>Geometry of Subgroups</b><br>Centre de Recherches Mathématiques, Montréal   | May 2023  |
| <b>Special Session, AMS Sectional Meeting</b><br><i>Ends and Boundaries of Groups</i> , University of Cincinnati   | Apr 2023  |
| <b>Redbud Topology Conference</b><br>University of Oklahoma  | Mar 2023  |
| <b>Special Session, AMS Sectional Meeting</b><br><i>Geometric Group Theory</i> , Georgia Institute of Technology   | Mar 2023  |
| <b>Topology and Group Theory Seminar</b><br>Vanderbilt University  | Mar 2023  |
| <b>Topology Seminar</b><br>Princeton University  | Mar 2023  |
| <b>Young Geometric Group Theory XI</b><br>Westfälische Wilhelms-Universität Münster  | Feb 2023  |
| <b>Mathematics Colloquium</b><br>Rutgers University at Newark  | Dec 2022  |
| <b>Geometry &amp; Topology Seminar</b><br>City University of New York  | Sep 2022  |
| <b>Wasatch Topology Conference</b><br>University of Utah, Brigham Young University   | Aug 2022  |
| <b>Big Mapping Class Groups at BC</b><br>Boston College  | Aug 2022  |
| <b>Mathematics Colloquium</b><br>State University of New York at Albany  | May 2022  |
| <b>Joint Mathematics Meetings</b><br><i>Topics and Generalizations in Geometric Group Theory</i> , Seattle<br><i>Low-Dimensional Manifolds</i> , Seattle | Mar 2022  |
| <b>Special Session, AMS Sectional Meeting</b><br><i>Subgroups in Nonpositive Curvature</i> , Tufts University  | Mar 2022  |
| <b>Spring Topology and Dynamical Systems Conference</b><br>Baylor University   | Mar 2022  |
| <b>Tetrahedral Geometry/Topology Seminar</b><br>West Chester University  | Mar 2022  |
| <b>Joint Geometry &amp; Topology Seminar</b><br>Bowling Green State University, University of Toledo   | Nov 2021  |
| <b>Geometry &amp; Topology Seminar</b><br>Temple University  | Nov 2021  |
| <b>Mathematics &amp; Statistics Colloquium</b><br>Swarthmore College   | Nov 2021  |
| <b>North British Geometric Group Theory Seminar</b><br>Newcastle University  | Nov 2021  |
| <b>Bi-College Math/Stat Colloquium</b><br>Haverford College  | Oct 2021  |
| <b>World of Geometric Group Theory</b>   | Aug 2021  |
| <b>Groups and Geometry in the South East</b><br>Oxford University  | June 2021 |
| <b>Nearly Carbon Neutral Geometric Topology</b>  | June 2021 |
| <b>Dynamics and Group Geometry Early Researchers Seminar</b><br>Warwick University   | May 2021  |
| <b>Geometric Group Theory and Topology Seminar</b><br>Tufts University   | Mar 2021  |
| <b>MAXIMALS Algebra, Geometry and Topology Seminar</b><br>Heriot-Watt University   | Mar 2021  |
| <b>Geometry and Topology Seminar</b><br>Bristol University   | Feb 2021  |
| <b>Geometry and Topology Seminar</b><br>Yale University  | Feb 2021  |

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| <b>Random and Arithmetic Structures in Topology Seminar</b><br>Mathematical Sciences Research Institute  | Dec 2020     |
| <b>Geometry and Topology Seminar</b><br>City University of New York  | Nov 2020     |
| <b>Geometry and Topology Seminar</b><br>Binghamton University  | Oct 2020     |
| <b>Pure Math Seminar</b><br>University of North Carolina–Greensboro  | Oct 2020     |
| <b>Big Surf(aces) Seminar</b>  | Oct 2020     |
| <b>Mathematics Colloquium</b><br>Rutgers University–Newark   | Sep 2020     |
| <b>Geometric Group Theory without Boundaries</b><br>Mini-course on Bass–Serre Theory   | July 2020    |
| <b>Trends in Low-Dimensional Topology</b>  | June 2020    |
| <b>Geometry and Topology Online</b><br>Warwick Mathematics Institute   | June 2020    |
| <b>Topology Seminar</b><br>University of California Riverside  | May 2020     |
| <b>Geometric Topology Seminar</b><br>Columbia University   | Apr 2020     |
| <b>Topology Seminar</b><br>University of Wisconsin at Milwaukee  | Mar 2020     |
| <b>Pick My Brain Seminar</b><br>Northeastern University  | Feb 2020     |
| <b>Geometric Group Theory Seminar</b><br>McGill University   | Jan 2020     |
| <b>Hyperbolic Lunch</b><br>University of Toronto   | Jan 2020     |
| <b>Dynamics, Geometry and Groups Seminar</b><br>Queens University  | Jan 2020     |
| <b>Boston Topology Seminar</b><br>Brandeis University  | Jan 2020     |
| <b>Special Session, AMS Sectional Meeting</b><br><i>Effective and Quantitative Advances in Low Dimensional Topology<br/>and Geometric Group Theory</i> , Binghamton University | Oct 2019     |
| <b>Algebra/Topology Seminar</b><br>State University of New York at Albany  | Oct 2019     |
| <b>Graduate Seminar</b><br>Temple University   | Sep 2019     |
| <b>Geometry and Topology Seminar</b><br>Temple University  | Sep 2019     |
| <b>LG&amp;TBQ</b><br>University of Michigan  | June 2019    |
| <b>Graduate Student Conference in Algebra, Geometry and Topology</b><br>Temple University  | June 2019    |
| <b>Spring Topology and Dynamical Systems Conference</b><br>University of Alabama at Birmingham   | Mar 2019     |
| <b>Geometric Group Theory and Topology Seminar</b><br>Tufts University   | Nov 2018     |
| <b>Eminar Tufts Student Seminar, 6 talks</b>   | 2017–2019    |
| <b>CONFERENCE PARTICIPATION</b>  |              |
| <b>Semester Program in Geometric Group Theory</b><br>Centre de Recherches Mathématiques, Montréal  | Feb–Jun 2023 |
| <b>Nearly Carbon Neutral Geometric Topology</b>  | Sep 2022     |
| <b>Communicating Mathematics</b><br>Cornell University   | Aug 2022     |

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|          | <b>Geometry, Arithmetic and Groups</b><br><i>Lightning Talk</i> , University of Texas at Austin                                | Jun 2022    |
|          | <b>Sage Days Duluth</b><br><i>Lightning Talk</i> , University of Minnesota at Duluth   | Jun 2022    |
|          | <b>YGGT X</b><br><i>Lightning Talk</i> , Newcastle University  | July 2021   |
|          | <b>Artin Groups, CAT(0) Geometry and Related Topics</b><br>The Ohio State University   | July 2021   |
|          | <b>ParaDIGMS Spring Conference</b><br>AMS, IMSI  | April 2021  |
|          | <b>Tech Topology Conference</b><br><i>Lightning Talk</i> , Georgia Institute of Technology                                     | Dec 2020    |
|          | <b>RTG Mini-Conference</b><br>University of Utah   | Feb 2020    |
|          | <b>Tech Topology Conference</b><br><i>Lightning Talk</i> , Georgia Institute of Technology                                     | Dec 2019    |
|          | <b>Algorithms in Complex Dynamics and Mapping Class Groups</b><br>ICERM, Brown University                                      | Nov 2019    |
|          | <b>Junior Geometry and Topology in the Midwest</b><br>University of Wisconsin at Madison                                       | Oct 2019    |
|          | <b>Wasatch Topology Conference</b><br>University of Utah, Brigham Young University   | Aug 2019    |
|          | <b>Aspects of Geometric Group Theory</b><br>Institut des Hautes Études Scientifiques   | July 2019   |
|          | <b>Young Geometric Group Theory VIII</b><br><i>Lightning Talk</i> , Colegio Mayor Miguel de Unamuno                            | July 2019   |
|          | <b>Spring Opportunities Workshop</b><br>American Institute of Mathematics  | Apr 2019    |
|          | <b>Graduate Student Topology and Geometry Conference</b><br><i>Lightning Talk</i> , University of Illinois at Urbana-Champaign | Mar 2019    |
|          | <b>Junior Geometry and Topology in the Midwest</b><br>University of Wisconsin at Madison                                       | Oct 2018    |
|          | <b>Women and Mathematics Program</b><br>Institute for Advanced Study   | May 2016    |
| 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 | <b>Rutgers University</b>  |             |
|          | Calculus II  | Spring 2022 |
|          | Calculus II  | Fall 2021   |
|          | Basic Linear Algebra   | Fall 2021   |
|          | Calculus II  | Spring 2021 |
|          | Topology   | Fall 2020   |
|          | <b>Tufts University</b>  |             |
|          | 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 |

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| AWARDS  | Robert P. Guertin Student Leadership Award finalist<br>Head Teaching Assistant  | 2020<br>AY 2019–20   |
| SERVICE | Referee work for <i>Groups, Geom. Dyn., New York J. Math.,<br/>Proc. Amer. Math. Soc., J. London Math. Soc., Rev. Mat. Iberoam., Topology Proceedings</i><br>Reviewing work for zbMath, MathSciNet<br>Organizer, Geometric Group Theory Reading Seminar<br>Treasurer, Tufts Organization of Graduate Students in Mathematics<br>Mathematics Department Graduate Union Steward<br>Mathematics Department Representative, Tufts Graduate Student Council<br>Graduate Student Member, Tufts Committee on Curricula | AY 2019–20<br>AY 2018–19<br>AY 2017–19<br>AY 2017–18<br>AY 2017–18 |
| OTHER   | <b>Languages:</b> English (native), German (intermediate), Japanese (intermediate)<br><b>Citizenship:</b> United States of America  |  |