

Lvzhou Chen

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Employment

- 2022–current **Assistant Professor**, *Purdue University*, USA.
2020–2022 **R. H. Bing Instructor**, *The University of Texas at Austin*, USA.

Education

- 2014–2020 **Ph.D. in Mathematics**, *The University of Chicago*, USA.
Advisor: Danny Calegari
Thesis: Surfaces in graphs of groups and the stable commutator length
2015 **M.S. in Mathematics**, *The University of Chicago*, USA.
2014 **B.S. in Mathematics and Applied Mathematics**, *Fudan University*, China.
Thesis Advisors: Zhi Lü and Yijun Yao
Thesis: \mathbb{Z}_2 -cohomological rigidity of small covers over n -Löbell

Research Interests

Geometry, topology, and dynamics in low dimensions, with an emphasis on stable commutator length and mapping class groups of infinite-type surfaces

Publications

1. **Scl in graphs of groups**, *Invent. Math.*, **221** (2020), no. 2, 329–396.
2. **(with Danny Calegari) Big mapping class groups and rigidity of the simple circle**, *Ergodic Theory and Dynamical Systems*, **41** (2021), no. 7, 1961–1987.
3. **(with Danny Calegari) Normal subgroups of big mapping class groups**, *Trans. Amer. Math. Soc.*, to appear, arXiv: 2110.07839, 21 pages.
4. **(with Chloe I. Avery) Stable torsion length**, *IMRN*, to appear, arXiv: 2103.14116, 39 pages.
5. **(with Alexander J. Rasmussen) Laminations and 2-filling rays on infinite type surfaces**, *Annales de l'institut Fourier*, to appear, arXiv: 2010.06029, 45 pages.
6. **Scl in free products**, *Algebr. Geom. Topol.*, **18** (2018), no.6, 3279–3313.
7. **Spectral gap of scl in free products**, *Proc. Amer. Math. Soc.*, **146** (2018), no.7, 3143–3151.
8. **(with Santana Afton, Danny Calegari, Rylee Alanza Lyman) Nielsen realization for infinite-type surfaces**, *Proc. Amer. Math. Soc.*, **149** (2021), no. 4, 1791–1799.

9. **(with Nicolaus Heuer) Spectral gap of scl in graphs of groups and 3-manifolds**, *submitted*, arXiv: 1910.14146, 69 pages.
10. **(with Nicolaus Heuer) Stable commutator length in right-angled Artin and Coxeter groups**, *submitted*, arXiv: 2012.04088, 41 pages.
11. **(with Sebastian Hurtado, Homin Lee) A height gap in $GL_d(\overline{\mathbb{Q}})$ and almost laws**, *preprint*, arXiv: 2110.15404, 13 pages.
12. **The Kervaire conjecture and the minimal complexity of surfaces**, *in preparation*.

Awards

- 2020 **Wirszup Fellowship**, *University of Chicago*, USA.
given to an excellent finishing graduate student

Invited Talks

- Aug. 2022 **Wasatch Topology Conference 2022**.
- Aug. 2022 **Geometric Group Theory Summer School**, Shanghai Center for Mathematical Sciences.
- Aug. 2022 **Metric Geometry for Young Scholars**, Capital Normal University.
- March 2022 **Semi-plenary talk, 2022 Spring Topology and Dynamics Conference**.
The Kervaire conjecture and the minimal complexity of surfaces
- March 2022 **Colloquium, Purdue University**.
The stable commutator length and the minimal complexity of surfaces
- Nov. 2021 **Geometric Analysis Seminar, Purdue University**.
The Kervaire conjecture and the minimal complexity of surfaces
- Nov. 2021 **CMSA Interdisciplinary Science Seminar, Harvard University**.
The Kervaire conjecture and the minimal complexity of surfaces
- June 2021 **International Young Seminar on Bounded Cohomology and Simplicial Volume**.
Stable torsion length
- June 2021 **GGT Seminar, University of Münster**.
Stable torsion length
- June 2021 **Infinite-type surfaces and big mapping class groups session, NCNGT Conference**.
Normal subgroups of big mapping class groups
- June 2021 **Oberseminar Groups and Geometry, Universität Bielefeld Bielefeld**.
Big mapping class groups and rigidity of the simple circle
- May 2021 **Topology Festival, Cornell University**.
Stable torsion length
- May 2021 **GGT session, 2021 Spring Topology and Dynamics Conference**.
Normal subgroups of big mapping class groups
- March 2021 **Geometry Topology Seminar, Georgia Tech**.
Big mapping class groups and rigidity of the simple circle

- Nov. 2020 **Big Surfaces Seminar, online.**
Existence of 2-filling rays
- Oct. 2020 **Topology/Geometry Seminar, Rutgers.**
Stable commutator lengths of integral chains in right-angled Artin groups
- Sept. 2020 **GGT Seminar, Ohio State University.**
Stable commutator lengths of integral chains in right-angled Artin groups
- Aug. 2020 **Topology Seminar, University of Texas at Austin.**
Stable commutator lengths of integral chains in right-angled Artin groups
- June 2020 **Hyperbolic Lunch, University of Toronto.**
Big mapping class groups and rigidity of the simple circle
- June 2020 **Hyperbolic geometry and manifolds session, NCNGT Conference.**
Stable commutator length in graphs of groups
- Feb. 2020 **ANT-CoG Seminar, University of North Carolina at Greensboro.**
Spectral gap of stable commutator length in graphs of groups and 3-manifolds
- Feb. 2020 **Geometry Seminar, University of Michigan.**
Big mapping class groups and rigidity of the simple circle
- Jan. 2020 **Geometry and Topology Seminar, Caltech.**
Stable commutator length in groups acting on trees
- Dec. 2019 **Topology Seminar, Fudan University.**
Spectral gap of stable commutator length in graphs of groups and 3-manifolds
- Oct. 2019 **Geom/Top Seminar, Washington University in St. Louis.**
Spectral gap of stable commutator length in graphs of groups and 3-manifolds
- Oct. 2019 **Geometry and Topology Seminar, University of Chicago.**
Big mapping class groups and rigidity of the simple circle
- Sept. 2019 **Dynamics Seminar, Boston College.**
Big mapping class groups and rigidity of the simple circle
- March 2019 **Topology and Geometric Group Theory Seminar, Cornell University.**
Stable commutator length in Baumslag–Solitar groups
- Nov. 2018 **Fall AMS southeastern sectional meeting, University of Arkansas.**
Stable commutator length in generalized Baumslag–Solitar groups
- Sept. 2017 **Fall AMS eastern sectional meeting, University at Buffalo.**
Spectral gap of stable commutator length

Referee Experience

J. AMS, Invent. Math., GAFA, T. AMS, Algebr. Geom. Topol. (twice), BLMS, J. Topol. Anal., L'Enseign Math, Topology and its Applications, Ann. Fenn. Math.

Teaching Experience

Instructor at UT Austin

- Spring 2022 **M 392 C**, *The Gromov norm and bounded cohomology (grad. topic course).*
- Fall 2021 **M 408 S**, *Integral Calculus for Science.*
- Spring 2021 **M 427 L**, *Advanced Calculus for Applications II.*

- Fall 2020 **M 328 K**, *Introduction to Number Theory*.
[Instructor at UChicago](#)
- 2019–2020 **Math 152 and 153**, *Calculus*.
 2018–2019 **Math 152 and 153**, *Calculus*.
 2017–2018 **Math 152 and 153**, *Calculus*.
 2016–2017 **Math 151, 152 and 153**, *Calculus*.
[College Fellow \(Teaching Assistant\) at UChicago](#)
- Spring 2016 **Math 263**, *Introduction to Algebraic Topology*.
 Winter 2016 **Math 262**, *Point-set Topology*.
 Fall 2015 **Math 267**, *Introduction to Representation Theory of Finite Groups*.
[Grader at UChicago](#)
- Spring 2019 **Math 319**, *Graduate Riemannian Geometry*.
 Fall 2016 **Math 317**, *Graduate Algebraic Topology*.
 Winter 2016 **Math 318**, *Graduate Differential Topology*.

Service and Mentorship

- 2022–current **Co-organizer of the Purdue Geometry Seminar**.
 Invited and hosted speakers
- 2020–2022 **Co-organizer of the Topology Seminar at UT Austin**.
 Suggested and invited speakers
- Fall 2021 **Mentor of the Texas Geometry Lab**.
 Guided a group of three undergraduates (Simon Xiang, Jimmy Xin, Ruiqi Zou) to explore stable commutator length in free groups using computer experiments from a topological/combinatorial point of view
- Spring 2020 **Organizer of Geometric Group Theory session in NCNGT conference**.
 Designed mini-sessions, invited speakers and hosted the session online
- Fall 2018 **Organizer of Reading Group, on surface subgroups**.
 Divided papers into manageable parts for one-hour talks, assigned talks to participating postdocs and graduate students, gave several talks
- 2017–2018 **Mentor for Directed Reading Program**.
 Found suitable topics and textbooks for undergraduate students to study
 - Mentee: Mary Stelow. Topic: 1-dimensional Complex Dynamics
 - Mentee: Jeremy Atos. Topic: Fundamental Groups and Homology Groups