Weichen Gu

The Ohio State University, Columbus, OH 43210

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Education

University of New Hampshire   *NH, US*

PhD Mathematics   *Sep. 2019 - Jul. 2024*

- Advisor: Liming Ge

Academy of Mathematics and Systems Science, CAS   *Beijing, China*

MS Mathematics   *Sep. 2014 - Jul. 2017*

- Advisor: Xiaotao Sun

University of Science and Technology of China   *Hefei, China*

BS Mathematics and Applied Mathematics   *Sep. 2010 - Jul. 2014*

Research Interests

Quantum Information, Operator Algebra and Number Theory

Professional Experience

2024-now	**Visiting Assistant Professor**, OSU
2023-2024	**Dissertation Year Fellowship, Summer TA Fellowship**, UNH
2019-2023	**Graduate Teaching Assistant**, Dept. of Mathematics and Statistics, UNH
2018-2019	**Research Scholar**, Harvard University
2014-2017	**Graduate student**, Academy of Mathematics and Systems Science, CAS
2016	**Graduate Teaching Assistant**, Dept. of Mathematics and Statistics, UCAS
2010-2012	**Summer Camp Instructor**, Jiaxing No.1 High School

Publications

Published

Bu, K, **Gu W**, Jaffe A. Quantum Ruzsa Divergence to Quantify Magic[J]. IEEE Transactions on Information Theory, 2025, 71(4), 2726-2740.

Bu K, **Gu W**, Jaffe A. Quantum Entropy and Central Limit Theorem[J]. Proceedings of the National Academy of Sciences, 2023, 120(25): e2304589120.

Gu W, Wei F. Möbius Disjointness for A Class of Exponential Functions[J]. The Quarterly Journal of Mathematics, 2022, 73(4): 1427-1468.

Gu W, Ma M, Shen J, Shi W. L^p-isometries of Grassmann Spaces in Factors of Type II [J]. Journal of Operator Theory, 2022, 87(2): 389-412.

Bu K, **Gu W**, Jaffe A. Duality of Graph Invariants [J]. Science China Mathematics, 2020, 63(8): 1613-1626.

Gu W, Wu W, Yuan W. Transition Probability Preserving Maps on A Grassmann Space in a Semifinite factor [J]. Journal of Mathematical Analysis and Applications, 2020, 487(1): 123957.

Submitted

Bu K, **Gu W**, Li X. 2025. Quantum locally recoverable code with intersecting recovery sets. arXiv preprint arXiv: 2501.10354

Gu W, Li X. 2024. Entropic van der Corput's Difference Theorem. arXiv preprint arXiv: 2403.05333

Bu K, **Gu W**, Jaffe A. 2024. Entropic Quantum Central Limit Theorem and Quantum Inverse Sumset Theorem. arXiv preprint arXiv: 2401.14385

Bu K, **Gu W**, Jaffe A. 2023. Discrete Quantum Gaussians and Central Limit Theorem. arXiv preprint arXiv:2302.08423

Bu K, **Gu W**, Jaffe A. 2023. Stabilizer Testing and Magic Entropy. arXiv preprint arXiv: 2306.09292

Awards & Fellowships

2023	**Dissertation Year Fellowship**, UNH
2023	**Summer TA Fellowship**, UNH
2014-2017	**Graduate Fellowship**, AMSS
2014	**Hua Loo-Keng Talent Class Excellence Award**, USTC
2013	**Chinese Academy of Sciences Fellowship for Undergraduate Students**, UCAS
2010	**Special Graduate Entrance Fellowship**, USTC

Invited Talks

Spring 2024. *On Entropic van der Corput's Difference Theorem*. Analysis Seminar, University of Oregon.

Fall 2023. *Möbius disjointness for a class of exponential functions*. Number Theory Seminar, Brigham Young University.

Summer 2023. *Higher Ordered Quantum Fourier Analysis*. Mathematical Picture Language Project, Harvard.

Spring 2023. *On the zeta-function of some non-commutative semigroups*. Noncommutative Geometry Seminar, TAMU.

Winter 2021. *On Entropy of Arithmetic Functions*. Major Presentation, UNH

Fall 2021. *Property T and the Haagerup property of II_1 factors*. Minor Presentation, UNH

Summer 2019. *Duality of Graph Invariants*. Institute Talks, AMSS.

Fall 2018. *Arithmetic Compactification of Natural Numbers*. Mathematical Picture Language Project, Harvard.

Spring 2018. *Duality of Graph Invariants*. Conference on Number Theory and Dynamical Systems, USTC.

Teaching Experience

Spring 2025	**MATH 3345 Foundations of Higher Mathematics**, Instructor, OSU
Fall 2024	**MATH 2415 ODE and PDE**, Instructor, OSU
Spring 2023	**MATH 528 Multidimensional Calculus**, Teaching Assistant, UNH
Fall 2022	**MATH 426 Calculus II**, Teaching Assistant, UNH
Spring 2022	**MATH 528 Multidimensional Calculus**, Teaching Assistant, UNH
Fall 2021	**MATH 528 Multidimensional Calculus**, Teaching Assistant, UNH
Summer 2021	**MATH 528 SY Multidimensional Calculus**, Instructor, UNH
Spring 2021	**MATH 528 Multidimensional Calculus**, Teaching Assistant, UNH
Fall 2020	**MATH 527 Differential Equations/Linear Algebra**, Teaching Assistant, UNH
Spring 2020	**MATH 527 Differential Equations/Linear Algebra**, Teaching Assistant, UNH
Fall 2019	**MATH 527 Differential Equations/Linear Algebra**, Teaching Assistant, UNH
Fall 2016	**Linear Algebra**, Teaching Assistant, UCAS
Summer 2012	**Lectures on Number Theory**, Instructor, Jiaxing No.1 High School
Summer 2011	**Lectures on Inequality Method**, Instructor, Jiaxing No.1 High School
Summer 2010	**Lectures on Combinatorics Proof**, Instructor, Jiaxing No.1 High School