

Weichen Gu

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Education

University of New Hampshire

PHD MATHEMATICS

• Advisor: Liming Ge

NH, US

Sep. 2019 - Jul. 2024

Academy of Mathematics and Systems Science, CAS

MS MATHEMATICS

Beijing, China

Sep. 2014 - Jul. 2017

University of Science and Technology of China

BS MATHEMATICS AND APPLIED MATHEMATICS

Hefei, China

Sep. 2010 - Jul. 2014

Research Interests

Quantum Information, Operator Algebra and Number Theory

Professional Experience

2025-now **Zassenhaus Assistant Professor**, OSU
2024-2025 **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

Publications

PUBLISHED

Bu, K, **Gu W**, Koh D E, et al. Decoded quantum interferometry under noise[J]. Quantum Science and Technology, 2025.
Bu, K, **Gu W**, Jaffe A. Quantum higher-order Fourier analysis and the Clifford hierarchy[J]. Proceedings of the National Academy of Sciences 122.45 (2025): e2515667122.
Bu, K, **Gu W**, Jaffe A. Stabilizer Testing and Magic Entropy via Quantum Fourier Analysis[J]. Communications in Mathematical Physics 406.10 (2025): 236.
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. 2026. Hamiltonian Decoded Quantum Interferometry for General Pauli Hamiltonians. arXiv preprint arXiv: 2601.18773

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. 2023. Discrete Quantum Gaussians and Central Limit Theorem. arXiv preprint arXiv:2302.08423

Awards & Fellowships

2024 **Graduate Student Research/ Scholarship/ Creativity Award**, UNH

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, Texas A&M University.

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, Academy of Mathematics and Systems Science .

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

Fall 2025 **MATH 3345 Foundations of Higher Mathematics**, Instructor, OSU
 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, Jiaying No.1 High School
 Summer 2011 **Lectures on Inequality Method**, Instructor, Jiaying No.1 High School
 Summer 2010 **Lectures on Combinatorics Proof**, Instructor, Jiaying No.1 High School