JAMES BERKELEY LARSEN

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EDUCATION

BS Brigham Young University — April 2023
Mathematics
Applied and Computational Mathematics Emphasis
Computer Science Minor
Graduated Magna Cum Laude (GPA: 3.98/4.00)

PhD University of Michigan — May 2028
Applied and Interdisciplinary Mathematics
Scientific Computing
GPA: 3.97/4.00

HONORS AND AWARDS

Michigan Institute for Computational Discovery & Engineering (MICDE) Fellow 2025

DOE Computational Science Graduate Fellowship (CSGF) 2023 to 2027

BYU Department of Mathematics Top Junior 2022

BYU College of Physical and Mathematical Sciences Dean's List 2021 to 2022

UT Austin Qiskit Fall Fest 1st Place 2021
Team project verifying quantum random number generation at quantum hackathon hosted by IBM at UT Austin

BYU Student Research Conference "Best in Session" 2021
Presentation on using machine learning to classify crowd noise

RESEARCH EXPERIENCE

Flatiron Institute, New York City, NY — Jun 2026 to Aug 2026
Intern, Center for Computational Quantum Physics
Research focus: stochastic trial wavefunctions for auxiliary-field quantum Monte Carlo (contributed to: https://safire.flatironinstitute.org/)

Lawrence Berkeley National Laboratory, Berkeley, CA — May 2025 to Aug 2025
CSGF Fellow Practicum, Applied Mathematics and Computational Research

Research focus: Quantum signal processing, optimal constrained polynomial approximation, Fourier analysis (developed software: https://qsppack.readthedocs.io/)

Sandia National Laboratories, Albuquerque, NM May 2022 to Apr 2025
R&D Intern, Quantum Algorithms and Applications Collaboratory
Research focus: Quantum algorithms for ground state preparation, speed limits for open quantum systems

BYU Department of Mathematics, Provo, UT Aug 2021 to Apr 2023
Undergraduate Research Assistant, with Dr. Mark Kempton
Research focus: Spectral properties of state transfer in quantum walks on graphs

TEACHING EXPERIENCE

Brigham Young University, Provo, UT Sep 2022 to Dec 2022
Department of Mathematics
Teaching Assistant: Algorithm Design and Optimization Lab

- Prepared curriculum and course materials for Python programming labs
- Taught content to 50+ students, provided one-on-one tutoring, graded work

Brigham Young University, Provo, UT Sep 2020 to Dec 2020
Department of Computer Science
Teaching Assistant: Data Structures and Algorithms

- Provided on-demand tutoring and C++ debugging assistance for 200+ students
- Collaborated with three professors and 20+ assistants to improve course content

PUBLICATIONS

Peer Reviewed Publications

Larsen, J.B., Albash, A., Magann, A.B., and Arenz, C., ”Trajectory-independent speed limits for controlled open quantum systems”
Published in *Physical Review A 7/16/2026*.

Larsen, J.B., Grace, M.D., Baczewski, A.D., and Magann, A.B., ”Feedback-based quantum algorithms for ground state preparation”
Published in *Physical Review Research 9/25/2024*.

Kocia, L., Calderon-Vargas, F.A., Grace, M.D., Magann, A.B., **Larsen, J.B.**, Baczewski, A.D., and Sarovar, M., ”Self-healing of Trotter error in digital adiabatic state preparation”
Published in *Physical Review Letters* 8/7/2023.

Larsen, J.B., Grace, M.D., Baczewski, A.D., and Magann, A.B., ”Lyapunov Control-inspired Quantum Algorithms for Ground State Preparation”
Published in *CSRI Summer Proceedings 2022* by Sandia National Laboratories.

Papers Under Review

Ballif, A., Kempton, M., **Larsen, J.B.**, Sandall, K., Tamon, C., Wai, T., ”Pretty good quantum state transfer via transcendental edge weights” (alphabetical author order)
Under review at *Quantum Inf. Process.*, preprint at arXiv:2609.16549.

Dong, Y., **Larsen, J.B.**, Lin, L., Sarkar, R., ”Constrained minimax approximation for quantum signal processing” (alphabetical author order)
Under review at *SIAM J. Sci. Comput.*, preprint at arXiv:2608.30937.

Cochran, S., **Larsen, J.B.**, Wray, A., Keiser, M.J., Rigetti, C., Veerapaneni, S., ”Equivariant Continuous Normalizing Flows with Offline Sampling for Fermionic Ground State Estimation”
Under review at *Journal of Chemical Physics*, preprint at arXiv:2607.18486.

PRESENTATIONS

Poster Presentation, ”Parallel Autoregressive Neural Quantum States for Quantum Chemistry at Scale”
MICDE Predictive Science Symposium, Apr 2026.

Oral Presentation, ”Speed Limits for Annealing in Open Quantum Systems”
APS March Meeting, Mar 2026.

Oral Presentation, ”Fast and Stable Phase Factor Finding for Quantum Signal Processing”
SIAM Student Mini-Symposium in Applied Mathematics, Sep 2025.

Poster Presentation, ”Path-independent Speed Limits for Open Quantum Systems”
Quantum Information Processing Conference (QIP), Feb 2025.

Lecture, ”Quantum Singular Value Transformation”
Arbeitsgemeinschaft on Quantum Signal Processing and Nonlinear Fourier Analysis, Oct 2024.

Poster Presentation, ”Feedback-based Quantum Algorithms for Ground State Preparation”
Southwest Quantum Information and Technology Workshop (SQuInT), Oct 2023.

Oral Presentation, ”Lyapunov Control-Inspired Quantum Algorithms for Ground State Preparation”
APS March Meeting, Mar 2023.

Poster Presentation, ”Quantum Walks on Graphs”
Joint Mathematics Meetings (JMM), Jan 2023.

Poster Presentation, ”Lyapunov Control-Inspired Quantum Algorithms for Ground State Preparation”
Southwest Quantum Information and Technology Workshop (SQuInT), Oct 2022.

Oral Presentation, ”Quantum Walks on Graphs”
BYU Student Research Conference (SRC), Mar 2022.

Oral Presentation, ”Crowd Noises Classification”
BYU Student Research Conference (SRC), Mar 2021.

PROFESSIONAL AFFILIATIONS

Society for Industrial and Applied Mathematics (SIAM) 2021-Present
BYU Chapter President from September 2021 to December 2022

LANGUAGES

English: Native

Chinese: Advanced Speaking and Listening, Intermediate Writing and Reading

French: Intermediate Speaking, Listening, and Reading