Kevin J. Randles
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EDUCATION

2020–Present	**Ph.D. in Physics**, University of Oregon, current GPA 4.21.
2020-2023	**M.S. in Physics**, University of Oregon, GPA 4.21.
2016–2020	**B.S. in Physics and Applied Mathematics** (double major), Weber State University, *summa cum laude*.

PUBLICATIONS

K. J. Randles, Steven J. van Enk, Success probabilities in time reversal based hybrid quantum state transfer, arXiv:2401.08110 preprint (2024).
K. J. Randles, Steven J. van Enk, Quantum state transfer and input-output theory with time reversal, *Phys. Rev. A* **108**(1), 012421 (2023).
K. J. Randles, Daniel V. Schroeder, Bruce R. Thomas, Quantum matrix diagonalization visualized, *Am. J. Phys.* **87**, 857 (2019). See the accompanying web app for an interactive exposition and pedagogical tool.

RESEARCH EXPERIENCE

4/23–Present	*Success probabilities in a time reversal based hybrid quantum-state-transfer protocol* (under peer review for publication). Graduate project at the University of Oregon advised by Steven van Enk.
Presentation	Presented in a poster session at the OMQ Research Symposium on 9/11/23.
Description	We are further analyzing the quantum state transfer scheme of our previous project (see below), focusing on the impact of errors. We show the utility of our scheme (in consonance with known error correction methods) in connecting hybrid nodes of a quantum network.
6/21–7/23	*Quantum State Transfer and Input-Output Theory with Time-Reversal.* Graduate project at the University of Oregon advised by Steven van Enk.
Presentations	Presented in a talk at the OMQ Research Symposium on 09/12/22 and in a poster session at the 24th Annual SQuInT Workshop on 10/20/22.
Description	We theoretically analyzed how photon manipulation can be used to transfer quantum information between systems with distinct spectral properties that are connected via a quantum channel. We find that the concomitant modifications to the effective description of the systems in the input-output formalism can best be understood in terms of a change to the state's time argument, where one system is effectively driven by the time reversed, frequency shifted, and stretched or compressed output of the other. As an exemplar of the underlying physics, we apply this theory to three-level Λ-type systems inside high finesse cavities, and we numerically illustrate how performing a unitary transformation to the intermediate photon results in improved quantum state transfer.

6/19–8/19	*Decoherence of Open Systems of Coupled Oscillators and Qubits*. Physics REU project at Brigham Young University advised by Jean-Francois Van Huele and Manuel Berrondo.
Presentation	Presented in a talk at the APS 4 Corners meeting on 10/12/19.
Description	We studied the dynamics of open systems consisting of coupled oscillators and qubits in minimal environments. Using the Wei-Norman ansatz for the time evolution operator of both the system and environment, we extract their time-dependence from the underlying Lie algebra of operators spanning the full Hamiltonian. To determine the decoherence of the system, we calculated linear entropies for various initial states and visualized their dynamics with Husimi functions and Bloch spheres. We investigated several systems and environments, considering different couplings between them.
10/18–6/19	*Quantum Matrix Diagonalization Visualized*. Research project for academic credit at Weber State University advised by Daniel Schroeder.
Presentations	Presented in a talk at the AAPT Summer meeting on 7/24/19 and as a physics seminar at Weber State University on 2/26/20.
Description	We visualized the diagonalization of Hamiltonian matrices by performing successive unitary rotation transformations to zero out off-diagonal elements while plotting the corresponding bound state eigenfunction approximations according to their energies. Results included a first author paper in the American Journal of Physics.
5/18–10/18	*Matrix and Variational Methods for Quantum Bound States*. Burkhart Physics Research Fellowship project at Weber State University advised by Daniel Schroeder.
Presentation	Presented in a poster session at the APS 4 Corners meeting on 10/12/18.
Description	We approximated solutions to the time-independent Schrödinger equation (TISE) in two-dimensions for a system of $GaAs$-based vertically coupled double-triangular potential wells embedded within a doped square region. We investigated and compared matrix diagonalization and variational relaxation methods for numerically solving the TISE.

PROFESSIONAL EXPERIENCE

9/20–Present	**Teaching Assistant** (Research Assistant in gaps), University of Oregon.
2024	Winter: Electromagnetic Theory
2023	Fall: Math Methods, Spring: Graduate Electromagnetic Theory, Galaxies and Expanding Universe (Intro Astronomy) Winter: Graduate Quantum Mechanics
2022	Fall: Graduate Quantum Mechanics, Summer: General Physics, Spring: Quantum Information and Computing, Graduate Electromagnetic Theory
2021	Spring and Winter: General Physics
2020	Fall: The Solar System (Intro Astronomy)
1/19–4/20	**Supplemental Instructor**, Weber State University.
8/19–4/20	**Math Grader**, Weber State University.
8/18–12/18	**Scientific Computing Lab Aide**, Weber State University.

WORKSHOPS

6/19–23/23	STAQ Quantum Ideas Summer School at Duke University.
2/22–24/23	Winter School on Contemporary Quantum Algorithms and Applications hosted by IPAM at UCLA.
1/02-06/23	CQN Winter School on Quantum Networks (held virtually).

AFFILIATIONS AND AWARDS

For 6/24	University of Oregon Professional Development Graduate Scholarship for attending the 2024 APS DAMOP Meeting.
9/20–6/21	Oregon Center for Optical, Molecular, and Quantum Sciences Director's Fellowship, University of Oregon.
9/18–8/20	American Physical Society student member.
6/19–6/20	American Association of Physics Teachers student member.
2020	Outstanding Graduate of the Department of Physics.
2020	Outstanding Graduate of the Department of Mathematics.
2020	Won Honorable Mention at the COMAP MCM Contest.
2016–20	Presidential Scholarship, Weber State University.
5/18–8/18	Burkhart Physics Research Fellowship, Weber State University.
2017–18	Freshman Chemistry Award, Weber State University, given to the top student each year.

SOFTWARE SKILLS

Proficient in Python, GlowScript VPython, Mathematica, JavaScript/HTML, and LaTeX. Some experience using Qiskit and R.

VOLUNTEER AND MENTOR EXPERIENCE

10/21-Present	UO PAGES mentor for undergraduates in physics.
2/23-24/24	Helped setup and co-led a graph theory station at the Eugene Youth Math Festival.
3/21-22/19	Judged the Ritchey Science and Engineering Fair.
11/10/18	Assisted a computational physics workshop for high school students at a Weber State Science Day promotion.
2017–18	Summer volunteer at two branches of the Davis County (UT) Public Library.