

CONTACT INFORMATION	University of Illinois at Urbana-Champaign Department of Physics 347 Loomis Laboratory Urbana, IL 61801	Phone: +1 (732) 896-8917 Email: kais@illinois.edu Web: kaishinbrough.com
EDUCATION	<p>University of Illinois at Urbana-Champaign/ Illinois Quantum Information Science and Technology Center (IQUIST) Ph.D., Physics Thesis: Title TBD Advisors: Virginia O. Lorenz, Elizabeth A. Goldschmidt, Paul G. Kwiat</p> <p>Oberlin College B.A., Physics, Philosophy Thesis: <i>Infrared and Thermal-Desorption Spectroscopy of H₂ and D₂ in Metal Organic Frameworks</i> Advisor: Stephen A. FitzGerald</p>	2017 – Present 2013 – 2017
RESEARCH	<p>Graduate University of Illinois at Urbana-Champaign/IQUIST, Lorenz, Goldschmidt, & Kwiat Laboratories Experimental and Theoretical Quantum Optics: Photonic and atomic quantum state characterization, engineering, and memory [4-9].</p> <p>Undergraduate University of Pennsylvania, Arratia Laboratory Experimental Fluid Dynamics: Design and fabrication of undergraduate fluid dynamics demonstrations. Oberlin College, FitzGerald Laboratory Experimental Physical Chemistry: Adsorption and gas separation in nanoporous materials [1-3]. University of Illinois at Urbana-Champaign, Lorenz Laboratory Experimental Quantum Optics: Photon statistics and photon-phonon interactions [5].</p>	
AWARDS & HONORS	<p>Optica Student Grant, CLEO/Europe-EQEC</p> <p>Illinois Proof of Concept (IPOC) Program, UIUC</p> <p>Emil Wolf Prize Finalist, Optica</p> <p>APS Division of Laser Science (DLS) Student Grant, FiO+LS</p> <p>NSF Quantum Information Science and Engineering Network (QISE-NET) Award</p> <p>Scott Anderson Award, Dept. of Physics, UIUC</p> <p>Physics Department Fellow, UIUC</p> <p>NSF Quantum Information Science and Engineering Network (QISE-NET) Award</p> <p>Highest Honors in Physics, Oberlin College</p> <p>Sigma Xi Honors Society Member</p> <p>John Frederick Oberlin Scholar, Oberlin College</p>	2023 2023 2022 2022 2020 – 2023 2020 2019 – 2020 2018 – 2021 2017 2016 – Present 2013 – 2017

PROFESSIONAL SERVICE	Graduate Representative , Senate Committee on Honorary Degrees, UIUC	2023 – Present
	Founder , Excellence in Outreach, Service, and Diversity Award, Dept. of Physics, UIUC	2022 – Present
	Student Ambassador , American Physical Society (APS)	2022 – Present
	Advisory Committee , Open Quantum Initiative, Chicago Quantum Exchange (CQE)	2022 – Present
	Graduate Representative , Open Quantum Initiative, Chicago Quantum Exchange (CQE)	2021 – 2022
	Quantum Council Fellow , P33 Chicago Quantum Council	2021 – 2022
	Lead Negotiator , COVID-19 Impact Bargaining, Graduate Employees' Organization (GEO), UIUC	2020 – 2021
	Lead Negotiator , Public Act 101-0620 Impact Bargaining, Graduate Employees' Organization (GEO), UIUC	2019 – 2021
	Grievance Officer , Graduate Employees' Organization (GEO), UIUC	2019 – 2020
	Graduate Mentor , Graduate-Undergraduate Peer Mentor Program, Dept. of Physics, UIUC	2017 – 2018
	Graduate Representative , Physics Graduate Studies Advisory Committee, Dept. of Physics, UIUC	2017 – 2018
	Undergraduate Representative , Physics Faculty Search Committee, Dept. of Physics, Oberlin College	2016 – 2017
	Undergraduate Peer Mentor , Depts. of Mathematics, Physics, and Philosophy, Oberlin College	2014 – 2017
	Peer Review for <i>PRL</i> , <i>PRX Quantum</i> , <i>PRA</i> , <i>JOSA B</i>	2020 – Present

PUBLICATIONS	10. K. Shinbrough, "Better pay for grad students," <i>Phys. Today</i> 76 , 10 (2023).
	9. K. Shinbrough, B. D. Hunt, S. Park, K. Oolman, T. Loveridge, T. O. Reboli, J. G. Eden, V. O. Lorenz, "High-Efficiency, Broadband, and Low-Noise Optical Quantum Memory with Full Amplitude and Phase Reconstruction," Submitted to <i>Nat. Photonics</i> (2023).
	8. K. Shinbrough, D. R. Pearson Jr., B. Fang, E. A. Goldschmidt, and V. O. Lorenz, "Broadband Quantum Memory in Atomic Ensembles," <i>Adv. At. Mol. Opt. Phys.</i> 72 , 297 (2023). Invited Chapter.
	7. K. Shinbrough and V. O. Lorenz, "Variance-based sensitivity analysis of Λ -type quantum memory," <i>Phys. Rev. A</i> 107 , 033703 (2022).
	6. K. Shinbrough, B. D. Hunt, and V. O. Lorenz, "Optimization of broadband Λ -type quantum memory using Gaussian pulses," <i>Phys. Rev. A</i> 103 , 062418 (2021).
	5. K. Shinbrough, Y. Teng, B. Fang, V. O. Lorenz, and O. Cohen, "Photon-matter quantum correlations in spontaneous Raman scattering," <i>Phys. Rev. A</i> 101 , 013415 (2020).
	4. Y. Zhang, R. Spiniolas, K. Shinbrough, B. Fang, O. Cohen, and V. O. Lorenz, "Dual-Pump Approach to Photon-Pair Generation: Demonstration of Enhanced Characterization and Engineering Capabilities," <i>Opt. Express</i> 27 , 19050 (2019).
	3. S. A. FitzGerald, K. Shinbrough, K. Rigdon, J. L. C. Rowsell, M. T. Kapelewski, S. H. Pang, K. V. Lawler, and P. M. Forster, "Temperature-programmed desorption for isotope separation in nanoporous materials," <i>J. Phys. Chem. C</i> 122 , 1995 (2018).
	2. K. Shinbrough, "Infrared and Thermal-Desorption Spectroscopy of H ₂ and D ₂ in Metal Organic Frameworks," Oberlin College Honors Thesis, OhioLINK Electronic Theses and Dissertations Center (2017).
	1. S. A. FitzGerald, C. T. Eckdahl, C. S. McDonald, J. N. Nelson, K. Shinbrough, H. W. H. Lai, and J. L. C. Rowsell, "Orientational ortho-H ₂ pair interactions in the microporous framework

MOF-5,” Phys. Rev. B **92**, 134304 (2015).

TALKS &
PRESENTATIONS

“High-Efficiency, Ultra-Broadband, and Low-Noise Quantum Memory in Barium Vapor,” Conference on Lasers and Electro-Optics/Europe (CLEO/Europe) and European Quantum Electronics Conference (EQEC), Munich, DE, June 2023.

“Efficient, Broadband Quantum Memory in Barium Vapor,” Gordon Research Seminar (GRS) and Gordon Research Conference (GRC), Newport, RI, June 2023.

“Ultra-Broadband, Low-Noise Quantum Memory in Atomic Barium Vapor with 95% Storage Efficiency,” Division of Atomic, Molecular, and Optical Physics (DAMOP) Meeting, Spokane, WA, June 2023.

“Efficient Quantum Memory for Ultrafast Photons,” Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, May 2023. Invited.

“Broadband Quantum Memory in Atomic Barium Vapor with 95% Storage Efficiency,” Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, May 2023.

“Efficient, Broadband Quantum Memory in Atomic Ensembles,” Chicago Quantum Summit, Chicago Quantum Exchange (CQE), Chicago, IL, November 2022. Poster.

“Efficient, Broadband Quantum Memory in Neutral Atomic Barium,” Illinois Quantum Information Science and Technology Center (IQUIST) Young Researcher Seminar, Urbana, IL, October 2022.

“Efficient THz-bandwidth Quantum Memory in Atomic Barium,” Frontiers in Optics/Laser Science Conference (FiO/LS), Rochester, NY, October 2022.

“Variance-Based Sensitivity Analysis of Λ -type Quantum Memory,” Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, May 2022. Poster.

“Engineering Phonon-Sideband Emission at Room Temperature,” Quantum Information Science and Engineering Network (QISE-NET) Reception, APS March Meeting, Chicago, IL, March 2022.

“A Simple Approach for Optimization of Optical Quantum Memories,” Illinois Quantum Information Science and Technology Center (IQUIST) Young Researcher Seminar, Urbana, IL, July 2021.

“Optimization of Λ -type Quantum Memories using Gaussian Control Fields,” Frontiers in Optics/Laser Science (FiO/LS) Conference, Virtual, September 2020.

“Ultra-broadband On-Resonance Quantum Storage in Hot Atomic Barium Vapor,” Division of Atomic, Molecular, and Optical Physics (DAMOP) Meeting, ~~Portland, OR~~ Virtual, June 2020.

“N₂ Defects in Silicon Nitride for Quantum Applications,” Quantum Information Science and Engineering Network (QISE-NET) Virtual Meeting, June 2020.

“N₂ Defects in Silicon Nitride for Quantum Applications,” Conference on Lasers and Electro-Optics (CLEO), ~~San Jose, CA~~ Virtual, May 2020.

“Revealing Photon-Matter Entanglement in Spontaneous Raman Scattering,” Photonics North, Quebec City, Quebec, Canada, May 2019.

“Raman Scattering Beyond the Master Equation: Photon-Matter Correlations and Statistics,” Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, May 2019.

“Modeling Photon-Excitation Pair Correlations for Quantum Applications,” Midwest Cold Atom Workshop (MCAW), Urbana, IL, November 2018.

“Raman-mediated Spontaneous Four-Wave Mixing in Si_3N_4 Waveguides,” Chicago Quantum Exchange Inaugural Summit, Chicago, IL, November 2018. Poster.

“Photon-Phonon Pair Correlations in Sapphire,” Frontiers in Optics/Laser Science Conference (FiO/LS), Washington, D.C, September 2018. Poster.

“Photon-Pair State Engineering in Raman-Mediated Four-Wave Mixing,” Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, May 2018. Poster.

“Photon-Phonon Correlations in Sapphire,” Quantum Information/Atomic, Molecular, and Optical Physics (QI/AMO) Seminar, Urbana, IL, April 2018.

“Quantum State Purity of Stokes Photons from Sapphire,” International Conference on Quantum Communication, Measurement and Computing (QCMC), Baton Rouge, LA, March 2018. Poster.

“Characterization of Raman Scattering in Sapphire for Investigation of LIAD in Barium-Sapphire Vapor Cells,” Colloquium on Undergraduate Research, Oberlin, OH, October 2016.

“Infrared and Thermal Desorption Spectroscopy of H_2 and D_2 in Metal Organic Frameworks,” Invited Speaker, Oberlin College Senior Symposium, Oberlin, OH, April 2017.

Last updated: July 31, 2023.