XINGYI WANG

Seattle, WA | 503-927-8970 | xingyiw@uw.edu | Google Scholar Profile

SUMMARY

- Ph.D. candidate in Electrical & Computer Engineering with 5+ years of experience in quantum optics, semiconductor spin qubits, and cryogenic photonic experiments.
- Expert in spin-photon interface of defect-based quantum devices, open quantum system simulations, photonic device simulation, automation of experiments and data analysis with Python. Experienced in both theoretical modeling and hands-on experimentation across ZnO, III-V, and diamond materials.
- Proven ability to lead projects from concept through publication in collaborative, fast-paced R&D environments.

EDUCATION

University of Washington, Seattle, WA
Ph.D., Electrical and Computer Engineering Sep 2020 – Dec 2025 (Expected) | GPA: 3.77 | Adviser: Kai-Mei Fu
Graduate Certificate in Quantum Information Science & Engineering

Reed College, Portland, OR
B.A. in Physics 2016 – 2020 | Major GPA: 3.54
Thesis: Modulated Photoluminescence for Lifetime Measurement of Cd(Se)Te Solar Cells

---

TECHNICAL SKILLS

Quantum Computing & Device Simulation: Qiskit, QuTiP, Azure Quantum, quantum simulation with trotter decomposition, photonic device and waveguide simulation with Lumerical FDTD
Experimental Techniques: Confocal microscopy, free-space optics, coherent spin control, optical absorption/transmission, time-correlated single photon counting (TCSPC), tunable laser optical cavity alignment; assembly, operation and maintenance of cryogenic and ultra-high vacuum systems
Fabrication & Materials: SEM, AFM, ion implantation, annealing, chemo-mechanical polishing
Software & Programming: Python, LabVIEW, Mathematica, Zemax, NI DAQ, Autodesk

---

EXPERIENCE

Quantum Defect Laboratory, University of Washington, Kai-Mei Fu Group
Graduate Researcher – Sep 2020 – Present
- Lead research on spin-photon interfaces in ZnO targeting scalable quantum networks and photonic integration. Explore viability of nuclear spin quantum memory and new defect discovery in ZnO.
- Simulate photon collection and waveguide coupling using Zemax and Lumerical FDTD&MODE.
- Build cryogenic confocal microscopes for single-defect optical characterization; detect single photon statistics with single photon counting modules and UV-Vis spectrometers in time and frequency domain.
- Conduct low-temperature optical spectroscopy and coherent spin manipulation of defect qubits under tunable/pulsed laser and microwave/RF excitation.
- Control optical pulses via AOM/EOM and trigger detectors through the time tagger.
- Develop Python-based real-time control programs for automated measurement and data processing.

Graduate Certificate in Quantum Information Science & Engineering, University of Washington
Accelerating Quantum-Enabled Technologies (AQET) Trainee 2022-2023 Cohort
- Completed coursework on quantum hardware, algorithms, and error correction, with emphasis on superconducting, trapped-ion, and photonic qubit platforms.
- Implemented quantum circuit simulations using Trotter decomposition of Hamiltonians on Azure Quantum, developed Qiskit-based programs for real-device execution.

Reed College Physics Department, Thesis advisor John Essick
Senior Thesis Researcher – 2019 – 2020
- Designed and built a modulated photoluminescence setup to measure carrier lifetime in CdTe solar cells.
- Automate data acquisition and analysis pipeline with LabVIEW.

Arizona State University, Zachary Holman Research Group
QESST Scholar – Summer 2019
- Developed PL-based metrology for perovskite solar cells; quantified external radiative efficiency and surface photovoltage through automated data collection and processing via LabVIEW.

SELECTED PUBLICATIONS

1. S. Zhang, T. Park, E. Perez, K.Li, **X. Wang**, Y. Wang, J. D. V. Bazantes, R. Zhang, J. Sun, K-M. C. Fu, H.Seo, Y.Ping, Deep Spin Defects in Zinc Oxide for High-Fidelity Single-Shot Readout. *Under Review at PRX.Quantum.*
2. E. R. Hansen, V. Niaouris, B. E. Matthews, C. Zimmermann, **X. Wang**, R. Kolodka, L. Vines, S. R. Spurgeon, and K-M. C. Fu, Isolation of Single Donors in ZnO. Phys. Rev. Lett. **133**, 146902 (2024).
3. **X. Wang**, C. Zimmermann, M. Titze, V. Niaouris, E. R. Hansen, S. H. D'Ambrosia, L. Vines, E. S. Bielejec, and K-M. C. Fu, Properties of donor qubits in ZnO formed by indium-ion implantation. Phys. Rev. Applied **19**, 054090 (2023). ***Editor's Suggestion.***
4. M. L. K. Viitaniemi, C. Zimmermann, V. Niaouris, S. D'Ambrosia, **X. Wang**, E. S. Kumar, F. Mohammadbeigi, S. P. Watkins, and K-M. C. Fu, Coherent Spin Preparation of Indium Donor Qubits in Single ZnO Nanowires. Nano Letters **2022** *22* (5), 2134-2139.
5. S. Kavadiya, A. Onno, C. C. Boyd, **X. Wang**, A. Cetta, M. D. McGehee, and Z. C. Holman, Investigation of the Selectivity of Carrier Transport Layers in Wide-Bandgap Perovskite Solar Cells. Sol. RRL, 5: 2100107 (2021).

CONTRIBUTED & INVITED PRESENTATIONS

- Materials Research Society (MRS) Spring Meeting, Seattle, WA (Apr 2025) — Controlled formation of Sn-Li donors in ZnO.
- Sandia Center for Integrated Nanotechnologies (CINT) Annual User Meeting, Santa Fe, NM (Sep 2023) — Indium donor qubits in ZnO. **Invited Talk.**
- The 32nd International Conference on Defects in Semiconductors, Rehoboth Beach, DE, (Sep 2023) — Properties of donor qubits in ZnO formed by indium-ion implantation.
- APS March meeting, Las Vegas, NV (Mar 2023) — Properties of donor qubits in ZnO formed by indium ion implantation.

SERVICE & HONORS

- Volunteer habitat interpreter, Seattle Aquarium (2023-2024)
- PhD Representative, UW ECE Curriculum Committee (2021–2022)
- Clean Energy Institute Graduate Fellowship, UW (2021–2022)
- Commendations for Academic Excellence, Reed College (2019–2020)
- Reed College Initiative Grant & Opportunity Grant (2019–2020)

MENTORING & LEADERSHIP

REU Mentor, UW Molecular Engineering Materials Center (2021-2024)
- Trained undergraduates on chemo-mechanical polishing protocol development, PL characterization, surface characterization, pulsed laser spectroscopy and TCSPC for ZnO substrates hosting donor spin qubits.
- WiSE Bridge Project Mentor: Mentored student in confocal microscope design and Zemax simulation.

Teaching Assistant, University of Washington
- EE 233 Circuit Theory (Winter/Spring 2021), EE 215 Fundamentals of ECE (Fall 2020)