

Yixin Xiao “Arthur”

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Skills Summary

- **Research and Development:** Led the development of the most efficient nanowire-based red-emitting micro-light-emitting diodes in the literature
- **Project Management:** Interdisciplinary collaboration, coordination of responsibilities, tracking deliverables
- **Technical Communication:** Co-author on 20+ papers and 10+ conference presentations
- **Computational Skills:** Data processing and analysis: MATLAB, originLab; Hardware control: LabVIEW; Simulation: Silvaco, Ansys Lumerical, COMSOL

Education

University of Michigan Ann Arbor, MI
• PhD in Electrical Engineering April 2025

Amherst College Amherst, MA
• Bachelor of Arts in Physics May 2019

Research Experience

Research Assistant, University of Michigan | Ann Arbor, MI August 2019 to July 2025

- Designed and synthesized novel III-nitride nanostructures by molecular beam epitaxy for optoelectronic applications and solar-to-chemical energy conversion
- Fabricated nanostructured nitride LED devices with submicron diameters and wavelengths from green to red
- Studied growth mechanisms of low-dimensional nitride hetero-structures and hetero-interfaces for next generation optoelectronic and quantum information applications
- Guided a smooth transition of projects

Research Assistant, Amherst College Physics Department | Amherst, MA May 2017 to May 2019

- Explored novel discrete symmetries of Bose–Einstein condensates (BECs) by studying filled-core vortices in different spin-2 magnetic phases
- Calibrated Digital Micromirror Device (DMD) as a potential alternative method for controlling BEC states

Academic Intern, Ningbo Institute of Industrial Technology | Ningbo, China June to July 2016

- Built different models to calculate the feasibility and effectiveness of an electro-optical nanowire assembly technique and found possible theoretical limitations to this potential assembly technique

Leadership Experience

Teaching Assistant, Amherst College Physics Department | Amherst, MA September 2016 to May 2019

- Coached in-class worksheet and laboratory procedures & students' coursework after class in office hours
- Courses include physics at introductory and intermediate levels

Peer Tutor, Amherst College | Amherst, MA September 2016 to May 2019

- Mentored the tutees in personalized ways to achieve their desired performance in their chosen courses
- Courses included: Introductory Physics, Logic, Multivariable Calculus

Liberal Arts Initiative Summer Seminars | Suzhou, China March 2016 to March 2018

Main Coordinator

- Planned for and organized a two-week camp for 45 Chinese high school students designed to facilitate cultural and intellectual exchanges
- Oversaw the program's transition to an official Amherst College program by standardizing various aspects of the program according to Amherst's programming standards
- Met with contact at potential new host school

Co-Organizer

- Assisted in identifying and formally inviting three Amherst College professors each year
- Facilitated more effective communications between the professors and the students as a teaching assistant

Select List of Publications

- Xiao, Y.**, Wu, Y., Maddaka, R. et al. "Spectrally pure, high operational dynamic range, deep red micro-LEDs," *Nano Letters* **2024** 24 (41), 12900-12906. DOI: 10.1021/acs.nanolett.4c03262
- Wu, Y., Zhou, P., **Xiao, Y.** et al. "Achieving atomically ordered GaN/AlN quantum heterostructures: The role of surface polarity," *P.N.A.S.* 120.44 (2023): e2303473120. <https://doi.org/10.1073/pnas.2303473120>
- Pandey, A., **Xiao, Y.**, Maddaka, R., et al. "A red-emitting micrometer scale LED with external quantum efficiency >8%." *Appl. Phys. Lett.* 10 April 2023; 122 (15): 151103. <https://doi.org/10.1063/5.0129234>
- Xiao, Y.**, Kong, X., Vanka, S., Dong, W.J. et al. "Oxynitrides enabled photoelectrochemical water splitting with over 3,000 hrs stable operation in practical two-electrode configuration." *Nat. Commun.* **14**, 2047 (2023). <https://doi.org/10.1038/s41467-023-37754-9>
- Dong, W.J., **Xiao, Y.**, Yang, K.R. et al. "Pt nanoclusters on GaN nanowires for solar-assisted seawater hydrogen evolution." *Nat. Commun.* **14**, 179 (2023). <https://doi.org/10.1038/s41467-023-35782-z>
- Wu, Y., **Xiao, Y.**, Navid, I. et al. "InGaN micro-light-emitting diodes monolithically grown on Si: achieving ultra-stable operation through polarization and strain engineering." *Light: Sci. Appl.* **11**, 294 (2022). <https://doi.org/10.1038/s41377-022-00985-4>
- Xiao, Y.**, Borgh, M.O., Blinova, A. et al. "Topological superfluid defects with discrete point group symmetries." *Nat. Commun.* **13**, 4635 (2022). <https://doi.org/10.1038/s41467-022-32362-5>
- Xiao, Y.**, Vanka, S., Pham, T. A., et al. "Crystallographic Effects of GaN Nanostructures in Photoelectrochemical Reaction." *Nano Letters* **2022**, 22, 6, 2236–2243. <https://doi.org/10.1021/acs.nanolett.1c04220>
- Xiao, Y.**, Borgh, M.O., Weiss, L.S. et al. "Controlled creation and decay of singly-quantized vortices in a polar magnetic phase." *Commun. Phys.* **4**, 52 (2021). <https://doi.org/10.1038/s42005-021-00554-y>

Awards and Fellowships

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| American Vacuum Society Dorothy M. and Earl S. Hoffman Scholarship | University of Michigan Ann Arbor, 2023 |
| SPIE Optics and Photonics Education Scholarship | University of Michigan Ann Arbor, 2023 |
| Society of Vacuum Coaters Foundation Scholarship | University of Michigan Ann Arbor, 2023 |
| NSF Graduate Research Fellowship | University of Michigan Ann Arbor, 2021 |
| Rackham Merit Fellowship | University of Michigan Ann Arbor, 2019 |
| George A. Plimpton Fellowship | Amherst College, 2019 |
| Gregory Call Summer Research Fellowship | Amherst College, 2018 |
| Summer Undergraduate Research Fellowship | Amherst College, 2017 |
| Bassett Physics Second Prize, Amherst College | Amherst College, 2016 |