

## Education

- **Harvard University** *Sep 2020-May 2025 (expected)*
  - Ph.D. Candidate in Applied Physics
  - S.M., Electrical Engineering (2023)
  - Advisors:
    - Marko Lončar, Tiantai Lin Professor of Electrical Engineering and Applied Physics
    - Evelyn L. Hu, Tarr-Coyne Professor of Applied Physics and Electrical Engineering
- **University of California, Berkeley** *Aug 2016-Aug 2020*
  - B.S. with Highest Honors, Electrical Engineering and Computer Sciences

## Research Interests

Photonics, quantum optics, nonlinear optics, semiconductor physics.

## Journal Papers

1. A. M. Day\*, J. R. Dietz\*, M. M. Sutula, **M. Yeh**, and E. L. Hu, “Deterministic laser writing of spin defects in nanophotonic cavities.” *arXiv preprint arXiv:2210.00177*, 2022.
2. D. Zhu\*, C. Chen\*, M. Yu\*, L. Shao, Y. Hu, CJ Xin, **M. Yeh**, S. Ghosh, L. He, C. Reimer, N. Sinclair, F. N. C. Wong, M. Zhang, and M. Lončar, “Spectral control of nonclassical light using an integrated thin-film lithium niobate modulator.” *Light: Science & Applications*, 11 (1), 1-9, 2022.
  - “Changing the color of quantum light on an integrated chip”, Harvard SEAS News, December 2022.
3. H. Kim, S. Z. Uddin, D.-H. Lien, **M. Yeh**, N. S. Azar, T. Kim, N. Gupta, Y. Rho, L. Li, C. P. Grigoropoulos, K. B. Crozier, and A. Javey, “Actively variable spectrum optoelectronics in black phosphorus”, *Nature*, 596, 232-237, 2021.
  - “Researchers demonstrate new semiconductor device possibilities using black phosphorous”, UC Berkeley News, August 2021.
4. S. Z. Uddin\*, H. Kim\*, M. Lorenzon, **M. Yeh**, D.-H. Lien, E. S. Barnard, H. Htoon, A. Weber-Bargioni, and A. Javey, “Neutral exciton diffusion in monolayer MoS<sub>2</sub>”, *ACS Nano*, 14 (10), 13433-13440, 2020.
5. C. Tan\*, M. Amani\*, C. Zhao, M. Hettick, X. Song, D.-H. Lien, H. Li, **M. Yeh**, V. R. Shrestha, K. B. Crozier, M. C. Scott, and A. Javey, “Evaporated Se<sub>x</sub>Te<sub>1-x</sub> thin films with tunable bandgaps for short-wave infrared photodetectors”, *Advanced Materials*, 32 (38), 2001329, 2020.
6. M. Hettick\*, H. Li\*, D.-H. Lien, **M. Yeh**, T.-Y. Yang, M. Amani, N. Gupta, D. C. Chrzan, Y.-L. Chueh, and A. Javey, “Shape-controlled single-crystal growth of InP at low temperatures down to 220 °C”, *Proceedings of the National Academy of Sciences U.S.A.*, 117 (2) 902-906, 2020.
7. J. Cho, M. Amani, D.-H. Lien, H. Kim, **M. Yeh**, V. Wang, C. Tan, and A. Javey, “Centimeter-scale and visible wavelength monolayer light-emitting devices”, *Advanced Functional Materials*, 30 (6), 1907941, 2019.
8. D.-H. Lien\*, S. Z. Uddin\*, **M. Yeh**, M. Amani, H. Kim, J. W. Ager III, E. Yablonovitch, and A. Javey, “Electrical suppression of all nonradiative recombination pathways in monolayer semiconductors”, *Science*, 364, 468–471, 2019.
  - “Electrostatic doping improves 2D semiconductor performance”, Chemistry World, May 2019.
  - “You Don’t Have to Be Perfect for TMDCs to Shine Bright”, LBNL News, May 2019.

\* indicates equal contribution.

## Conference Papers

1. **M. Yeh\***, C. J. Xin\*, Y. Hu, S. Ghosh, A. Beyer, E. Wollman, M. D. Shaw, N. Sinclair, E. L. Hu, D. Zhu, and M. Lončar, “Single-photon frequency shifting using coupled microring resonators on thin-film lithium niobate,” *CLEO: QELS\_Fundamental Science*, FTh5C-4, 2022.

\* indicates equal contribution.

## Research Experience

- **Graduate Research Assistant, Harvard University** *Sep 2020-present*

### Electro-optic control of single photons

- Developing quantum logic gates for frequency-domain photonic quantum computing using an electronically reconfigurable lithium niobate photonic molecule.
- Design, fabrication, and characterization of integrated photonic switching networks for time-bin cluster state generation.

- **Undergraduate Researcher, Javey Lab, UC Berkeley** *May 2018-May 2020*

### Optical characterization of exciton physics

- Performed pump-dependent, doping-dependent PL measurements on colloidal quantum dot thin films as a sensitive probe of the radiative and nonradiative exciton recombination pathways.
- Designed and fabricated monolayer semiconductor device structures for applying gate voltage while measuring PL. Discovered that encapsulating the monolayer in PMMA reduces hysteresis, enabling strong and repeatable gate control that can suppress all nonradiative recombination.
- Extended the gated PL device concept to devices for diffusion measurements, in order to visualize the transport of different exciton species in 2D materials.

- **Undergraduate Researcher, Pines Lab, UC Berkeley** *June 2017-Jan 2018*

### Enhanced NMR sensitivity *via* NV center polarization transfer

- Fabricated NMR probes for nanodiamond and  $^{13}\text{C}$  enriched diamond samples. Wrote MATLAB and Python programs to analyze the impedance matching of the RF probe circuit.

## Teaching Experience

- **Teaching Fellow, Harvard University** *2021*

- Fall 2021 - ES 173: *Introduction to Electronic and Photonic Devices* (Instructor: *Evelyn L. Hu*)

- **Teaching Assistant, UC Berkeley** *2017-2020*

- Summer 2020 - EECS 16B: *Designing Information Devices and Systems II* (Instructors: *Emily Naviasky, Simon Kuang, Forrest Laine*)
- Spring 2019 - EECS 16B: *Designing Information Devices and Systems II* (Instructors: *Kristofer Pister, Jaijeet Roychowdhury, Anant Sahai*)
- Spring 2018 - EECS 16A: *Designing Information Devices and Systems I* (Instructors: *Vladimir Stojanovic, Laura Waller*)
- Fall 2017 - EECS 16A: *Designing Information Devices and Systems I* (Instructors: *Elad Alon, Anant Sahai*)

- Summer 2017 - EECS 16A: *Designing Information Devices and Systems I* (Instructors: *Daniel Aranki, Filip Maksimovic, Vasuki Narasimha Swamy*)

- **Course Reader, UC Berkeley**

2017-2018

- Fall 2018 - EE 105: *Microelectronic Devices and Circuits* (Instructor: *Clark Nguyen*)
- Spring 2017 - EECS 16A: *Designing Information Devices and Systems I* (Instructors: *Vladimir Stojanovic, Babak Ayazifar*)

## Service and Outreach

- **Quantum Engineering Research and You (QuERY)**

2022-present

- Co-founder
  - \* QuERY is a semester-long workshop that aims to introduce high school students of all backgrounds to scientific research by connecting them with graduate students in the quantum engineering sector.
- Spring 2022: Bellaire High School
  - \* 12 mentors across MIT and Harvard delivered 9 presentations and mentored 7 final project teams. Over 20 students were in regular attendance, with 17 participating in the optional final project.
  - \* Final projects consisted of 3 journal clubs and 4 Python-based simulations. Topics included Bloch sphere, Ising model, and spin squeezing.

- **Harvard SEAS Graduate Council**

2020-2022

- 2021-2022: Co-president
  - \* Coordinated the design, implementation, and analysis of a school-wide climate survey for graduate students in the School of Engineering and Applied Sciences.
  - \* Oversaw funding distribution toward community-building, professional development, and outreach activities.
- 2020-2021: Outreach coordinator

## Honors and Awards

- National Defense Science and Engineering Graduate (NDSEG) Fellowship (2022)
- National Science Foundation Graduate Research Fellowship Program (NSF GRFP), Honorable Mention (2022)
- Derek Bok Center Certificate of Distinction in Teaching, Harvard University (2022)
- Ford Foundation Fellowship, Honorable Mention (2021, 2022)
- Harvard Quantum Initiative Graduate Fellowship, Harvard University (2020)
- Arthur M. Hopkin Award, UC Berkeley (2020)
- Dean's List, UC Berkeley (2016-2020)
- EECS Honors Program, UC Berkeley (2019-2020)
- Eta Kappa Nu (HKN) Honor Society, UC Berkeley (Inducted 2017)
- George Lorbeer Lowell Alumni Association Scholarship (2016)
- Seward Chapman Lowell Alumni Association Scholarship (2016)