

## Education

- **Harvard University** *Aug 2020-present*
  - **GPA:** N/A
  - **Major:** PhD, Applied Physics
- **University of California, Berkeley** *Aug 2016-May 2020*
  - **GPA:** 3.975
  - **Major:** B.S., Electrical Engineering and Computer Sciences

## Research Interests

Photonics, quantum technologies, quantum optics, optoelectronics, optical materials.

## Journal Papers

1. 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.
2. 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*, 29, 1907941, 2019.
3. 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.
4. 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  $\text{Se}_x\text{Te}_{1-x}$  thin films with tunable bandgaps for short-wave infrared photodetectors”, *Submitted*.
5. 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  $\text{MoS}_2$ ”, *Submitted*.

\* indicates equal contribution.

## Research Experience

- **Ali Javey Lab, Undergraduate Researcher** *May 2018-May 2020*

### Optical characterization of exciton physics

- Helped lead a project investigating whether electrostatic doping can be used to enhance the photoluminescence quantum yield of quantum dots.
- Developed 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.

### Materials for electronics, optoelectronics, and photonics

- Performed PL spectroscopy measurements and data analysis for projects on low temperature synthesis of III-V semiconductors and large-area  $\text{WS}_2$  monolayer light-emitting devices.

• Alexander Pines Lab, Undergraduate Researcher

June 2017-Jan 2018

Enhanced NMR sensitivity *via* NV center polarization transfer

- Streamlined the fabrication process (including frequency tuning and impedance matching) for two NMR probe configurations corresponding to different sample types (nanodiamond powder,  $^{13}\text{C}$  enriched diamond). Wrote MATLAB/Python scripts to analyze the probe circuit.
- Used COMSOL to simulate the resonant frequencies and Q factor of a microwave cavity.

## Teaching Experience

• UC Berkeley, Teaching Assistant

- 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, Jaideep 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)

• UC Berkeley, Course Reader

- 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)

## Honors and Awards

- 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)
- Lowell Alumni Association Scholarship (2016)

## Skills

- **Fabrication:** Evaporation, photolithography (cleanroom, development, etching, liftoff), oxygen plasma cleaning, soldering, drill press, bandsaw
- **Characterization:** Laser measurement (micro-photoluminescence spectroscopy, absorption spectroscopy, laser alignment, optical table setup), optical microscope, AFM, probe station, electronic test equipment (oscilloscope, multimeter, LCR meter, function generator, semiconductor parameter analyzer, network analyzer)
- **Software:** Cadence, LTSpice, Git, Origin, ZEMAX OpticStudio, LayoutEditor, L<sup>A</sup>T<sub>E</sub>X
- **Programming Languages:** Python, Java, C, MATLAB, Processing

## Relevant Coursework

- **Physics:** Classical electromagnetism, statistical mechanics and thermal physics, solid state physics, quantum mechanics, quantum information science, quantum and nonlinear optics.
- **Electrical Engineering:** Analog integrated circuits, signals and systems, digital signal processing, device physics, graduate device physics, microfabrication, microelectromechanical systems (MEMS), optical engineering.
- **Computer Science:** Data structures, machine structures.
- **Mathematics:** Multivariable calculus, linear algebra, differential equations, discrete mathematics, probability theory.