Shiekh Zia Uddin

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Google Scholar

Education

Massachusetts Institute of Technology — Cambridge, MA, USA
Postdoctoral Associate in the Research Laboratory of Electronics (RLE) — June 2022 - present
Research Advisor: Professor Marin Soljačić

University of California, Berkeley — Berkeley, CA, USA
PhD in Electrical Engineering & Computer Sciences — August 2017 - May 2022
Research Advisor: Professor Ali Javey

Bangladesh University of Engineering and Technology — Dhaka, Bangladesh
Bachelor of Science in Electrical and Electronic Engineering — 2010 - 2015
Research Advisors: Professor Anisuzzaman Talukder, Professor Kamrul Hasan
−1st place among 195 students in the class.
−GPA: 3.98/4.00, Highest in the university in my graduating batch of $\sim$ 1000 students.

Active research topics

Photophysics of low-dimensional semiconductors, two-dimensional semiconductors, electroluminescence, plasmonics, nanophotonics, total internal reflection fluorescence microscopy, cell membrane imaging, digital signal processing.

Publications

* indicates equal contribution

13 **Uddin, S.Z.***, Higashitarumizu, N.*, Kim, H., Rahman, I K M Reaz, and Javey, A. Efficiency Roll-off Free Electroluminescence from Monolayer WSe_2. *Nano Letters*, 2022.

12 **Uddin, S.Z.***, Higashitarumizu, N.*, Kim, H., Yi, J., Zhang, X., Chrzan, D. and Javey, A. Enhanced Neutral Exciton Diffusion in Monolayer WS_2 by Exciton–Exciton Annihilation. *ACS Nano*, 2022.

11 **Uddin, S.Z.***, Higashitarumizu, N.*, Kim, H., Rabani, E. and Javey, A. Engineering Exciton Recombination Pathways in Bilayer WSe_2 for Bright Luminescence. *ACS Nano*, 16, 1, 1339–1345, 2022.

10 Kim, H.*, **Uddin, S.Z.***, Higashitarumizu, N., Rabani, E. and Javey, A., Inhibited nonradiative decay at all exciton densities in monolayer semiconductors. *Science*, 373(6553), pp.448-452. 2021.
Selected News:
LED Material Shines Under Strain –LBNL News, Nanowerk News, Newswise Phys.org
Researchers strain to produce light from 2D semiconductor – Materials Today
LEDs: More Efficient Under Strain – Optics & Photonics News
Applying Strain on a Thin Semiconductor Film to Achieve Near 100% Light-Emission Efficiency – AZO Materials
Scientists devise a simple tactic to increase the efficiency of LED devices – Newsbreak

9 Kim, H., **Uddin, S.Z.**, Lien, D.H., Yeh, M., Azar, N.S., Balendhran, S., Kim, T., Gupta, N., Rho, Y., Grigoropoulos, C.P. and Crozier, K.B. Actively variable-spectrum optoelectronics with black phosphorus. *Nature*, 596(7871), pp.232-237, 2021.
Selected News:
Researchers demonstrate new semiconductor device possibilities using black phosphorous – UC Berkeley News
New semiconductor device possibilities using black Phosphorus – Phys.org
Bright idea: new LEDs can detect off food and lethal gases – Mirage News, Tech Xplore, Science Daily, Nature Asia
LEDs Shed Light On Whether Food Is Going Bad – IFLscience
Infrared device to detect spoiled food and lethal gases – Labonline
Tunable LEDs shrink infrared spectroscopy down to phone-friendly size – New Atlas

8 **Uddin, S.Z.**, Rabani, E. and Javey, A. Universal Inverse Scaling of Exciton–Exciton Annihilation Coefficient with Exciton Lifetime. *Nano Letters*. 21(1), pp. 424–429, 2021.

7 **Uddin, S.Z.***, Kim, H.*, Lorenzon, M., Yeh, M., Lien, D.H., Barnard, E.S., Htoon, H., Weber-Bargioni, A. and Javey, A. Neutral exciton diffusion in monolayer MoS_2. *ACS Nano*, 14(10), pp.13433-13440, 2020.

6 Lien, D.H.*, **Uddin, S.Z.***, Yeh, M., Amani, M., Kim, H., Ager, J.W., Yablonovitch, E. and Javey, A. Electrical suppression of all nonradiative recombination pathways in monolayer semiconductors. *Science*, 364(6439), pp.468-471, 2019.
Selected News:
You Don't Have to Be Perfect for TMDCs to Shine Bright – LBNL News, Newswise
Electrostatic doping improves 2D semiconductor performance – Chemistry World

5 **Uddin, S.Z.** and Talukder, M.A. Two-dimensional materials for improved resolution in total internal reflection fluorescence microscopy. *Materials Research Express*, 4(9), p.096203, 2017.

4 **Uddin, S.Z.** and Talukder, M.A. Imaging of cell membrane topography using Tamm plasmon coupled emission. *Biomedical Physics & Engineering Express*, 3(6), p.065005, 2017.

3 **Uddin, S.Z.**, Tanvir, M.R. and Talukder, M.A. A proposal and a theoretical analysis of an enhanced surface plasmon coupled emission structure for single molecule detection. *Journal of Applied Physics*, 119(20), p.204701, 2016.

2 Khan, E.*, Al Hossain, F.*, **Uddin, S.Z.***, Alam, S.K. and Hasan, M.K. A robust heart rate monitoring scheme using photoplethysmographic signals corrupted by intense motion artifacts. *IEEE Transactions on Biomedical engineering*, 63(3), pp.550-562, 2015.

1 Sorzano, C.O.S., Khan, A., Al Hossain, F., Ullash, T., Raihan, A., Haque, M.A., Liang, K.W., Wu, Y.C., Chao, G.L., Huang, K.H., **Uddin, S.Z.** and Sun, S.H. Undergraduate Students Compete in the IEEE Signal Processing Cup: Part 2 [sp Education]. *IEEE Signal Processing Magazine*, 32(5), pp.109-111., 2015.

Submitted and in preparation

1 **Uddin, S. Z.**, Higashitarumizu, N., Weinberg, D., Rahman, I K M R., Rabani, E., Yablonovitch, E. and Javey, A. Excitonic to Free Carrier Transition in Black Phosphorus, 2022.

Conference Proceedings

4 **Uddin, S.Z.**, and Talukder, M.A., 2016, December. Reduction of detection volume in total internal reflection fluorescence microscopy using graphene. In 2016 9th *International Conference on Electrical and Computer Engineering (ICECE)* (pp. 143-146).

3 **Uddin, S.Z.**, Tanvir, M.R., Hassan, S. and Talukder, M.A., 2016, March. Surface plasmon coupled emission enhancement with nanoparticles in the metal layer. In 2016 IEEE 6th *International Conference on Photonics (ICP)* (pp. 1-3).

2 **Uddin, S. Z.**, Tanvir, M.R. and Talukder, M.A., Surface Plasmon Coupled Emission with Fluorescent Molecules as Broadband Dipoles. In 2015 *IEEE Photonics Conference (IPC)*.

1 **Uddin, S. Z.**, Khan, E. and Imran, N.M., 2012, December. FET twin model. In 2012 7th *International Conference on Electrical and Computer Engineering* (pp. 667-669).

Professional and Teaching Experiences

8 Lab Manager, Activity Lead, and Lead Safety Officer, Material Science Division
Lawrence Berkeley National Laboratory, Berkeley, CA – 2019-2022

7 GSI, Electrical Engineering and Computer Sciences, University of California, Berkeley
Designed online contents during the COVID 19 pandemic. – 2020

6 GSI, Electrical Engineering and Computer Sciences, University of California, Berkeley – 2019

5 Kavli ENSI/Winton Joint Workshop, University of Cambridge, UK
Attendee of Winton Program for the Physics of Sustainability at the University of Cambridge and the Kavli Energy NanoScience Institute (ENSI) at the University of California – 2019

4 Kavli Energy NanoScience Institute (ENSI) Group Representative, UC Berkeley, CA – 2019-2022

3 Lecturer, Department of Electrical and Electronic Engineering (EEE), Bangladesh University of Engineering and Technology (BUET) – 2015-2017

2 Technical Committee Member of International Conference 9th International Conference on Electrical and Computer Engineering (ICECE), Dhaka, Bangladesh – 2016

1 100 Member Bangladeshi Youth Delegation Visit to India – 2014

Academic Honors and Awards

12 MRS Graduate Student Award (Gold) - Spring Meeting – 2022

11 Stanford Science Fellowship Finalist, Stanford University – 2022

10 J. Robert Oppenheimer (JRO) Distinguished Postdoctoral Fellowship
Los Alamos National Laboratory (LANL) – 2022

9 UC Berkeley Graduate Division Conference Travel Grant – 2021, 2022

8 Kavli / Winton Travel Grant, University of Cambridge, UK – 2019

7 Bangladesh-Sweden Trust Fund (BSTF) Grant – 2017

6 Prime Ministers Gold Medal Award, Bangladesh – 2015

5 Kintar-UI-Haque Lashkar Gold Medal, BUET – 2015

4 Chancellor's Gold Medal (Highest honor for BUET undergrad students) – 2015

3 Deans List, BUET – 2011-2015

2 ICASSP 2014 Travel Grant, IEEE – 2014

1 University Merit Scholarship, BUET – 2010

Competition awards

4 MATLAB Programming Contest – 2015

3 IEEE Signal Processing Cup – 2014

2 4th Position, Bangladesh Physics Olympiad (BdPhO) – 2014

1 National Champion, Inter University Math Olympiad, Bangladesh - 2011

Invited talks and seminars

6 Solid State Technology and Devices Seminar, UC Berkeley – 2022

5 Berkeley Sensor & Actuator Center (BSAC) Student Researcher Seminar – 2022

4 Berkeley Sensor & Actuator Center (BSAC) Spring Seminar – 2022

3 University of California Multicampus-National Laboratory Collaborative Research and Training program – 2020

2 Center for Energy Efficient Electronics Science (E3S) – 2019

1 Berkeley Sensor & Actuator Center (BSAC) Spring Seminar – 2019

Contributed talks and posters

8 Berkeley Sensor & Actuator Center (BSAC) (Poster) – 2018-2022

7 Kavli Energy NanoScience (ENSI) Berkeley – 2019, 2020

6 MRS Meeting and Exhibit (Fall and Spring) – Fall 2020, Fall 2021, Spring 2022

5 Material Science Division DOE Review (Poster) – 2019, 2022

4 IEEE International Conference on Electrical and Computer Engineering (ICECE) - 2016

3 IEEE International Conference on Photonics (ICP) – 2016

2 IEEE Photonics Conference (IPC) – 2015

1 IEEE International Conference on Electrical and Computer Engineering – 2012