Abdullah S. Abbas

Nanomaterials Engineer

abdullah.s.abbas@berkeley.edu || asabbas.github.io || (510)-472-7461

S K I L L S

Syntheses & Fabrications: Schlenk-line Quantum Dots & Oxide Nanoparticles Syntheses ($CsPbBr_3$, CdSe/CdS, PbS, InP, ZnO, TiO_2), Spin-Coating, Electrodeposition, CVD, ALD, Sputtering, Thermal Evaporation, Photolithography.

Characterizations: TEM, SEM, EDX, AFM, FTIR, Raman, Quantum Yield, Laser spectroscopy, Spectrophotometer, Spectrofluorometer, Ellipsometry, Profilometer (Dektak), Mechanical probe station, Oscilloscope, Optical Microscope.

Simulation & Programming: Quantum Espresso (DFT engine), Scaps (solar simulator tool), PSpice, OrCAD Capture, COMSOL Multiphysics, Python.

Electronics: EagleCAD and KiCAD, Arduino, Raspberry Pi, Amplifiers (OpAmp/transistors).

Rapid Prototyping: CNC Machining, Soldering Through-hole and SMD, AutoCAD, Extrusion-based 3D Printing.

WORK EXPERIENCE

Quantum Solutions Inc, VP of Product / May 2018 – July 2018
Product Manufacturing, Inventory, and Packaging Management.

Quantum Solutions Inc, Product Developer / December 2017 – July 2018
-Large Scale Production of PbS Quantum Dots Using Microfluidic Flow-based Reactor.
-Perovskite Quantum Dots for LCDs and UV Detector Applications.
   Pitch Competitions:
      2018 Pitched in **MIT Enterprise Forum** and won first place with an award of 100k SAR (~$26k)

University of California, Berkeley, Prof. A. Paul Alivisatos / January – August 2016
Synthesized quantum dots and studied their photo-physics dynamics using laser spectroscopy and spectrometers.

University of Toronto, Prof. Edward H. Sargent / August 2014 – April 2015
Designed solar cell structure that achieved a record efficiency of 9.99% early 2016.

King Abdullah University of Science and Technology, Prof. Omar Mohammed / January – April 2014
Researched an optimal Donor-Acceptor organic molecules for LEDs and used Ultrafast Femtosecond Laser spectroscopy and spectrometers techniques to study their efficiency and stability.

University of Waterloo, Prof. Vivek Maheshwari / April – December 2013
Built single electron transistor using Gold Nanoparticles with Nanowires of Zinc Oxide (ZnO) as the gate electrode.

E D U C A T I O N

Doctor of Philosophy (PhD): Materials Science and Engineering,
University of California, Berkeley, Supervisor: A. Paul Alivisatos / January 2019 – Present

Master of Science in Engineering: Materials Science and Engineering,
University of California, Berkeley, Supervisor: A. Paul Alivisatos / January 2019 – May 2021

Bachelor of Applied Science: Honours Nanotechnology Engineering,
Co-operative Program, University of Waterloo / September 2012 – April 2017

Relevant Projects:

DropLab (Capstone Project) / September 2016 – July 2017
Developed a device for digitally manipulating the motion of fluid drops. The device required an adjustable AC Signal Amplifier operating at very high voltages. The various circuit designs were evaluated using simulation tools, and machined using an in-house CNC. This project also involved material science principles to create hydrophobic and dielectric coatings whose wetting characteristics were a function of the applied voltage.

Water Treatment: Researched novel techniques to remove metal ions contaminants from water using cellulose nanocrystal functionalized with supermagnatic iron oxide nanoparticles and glutathione as a chelating agent.