# Abdullah S. Abbas

Materials Engineer

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## SKILLS

**Syntheses & Fabrications:** Schlenk-line Quantum Dots & 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, XRD, FTIR, Raman, Quantum Yield, Laser spectroscopy, Spectrophotometer, Spectrofluorometer, Ellipsometry, Profilometer, 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

**Intel Corporation,** Process Engineer / September 2024 – Present
- Thin Films

**University of Chicago,** Postdoctoral Scholar in Chemistry / July – September 2024
- Setup a novel spectroscopic tool, Photothermal Threshold Quantum Yield, to measure near unity photoluminescence quantum yield with relative error down to 0.2% compared to existing tools with >2%

**University of California, Berkeley,** PhD Candidate / January 2019 – May 2024
- Conducted air-free syntheses of Perovskite, Cadmium Chalcogenide, and Lead Chalcogenide Nanocrystals
- Executed optical and structural characterizations of synthesized materials

**Quantum Solutions Inc**, VP of Product / May – July 2018
- Managed product manufacturing, inventory, and packaging

**Quantum Solutions Inc**, Product Developer / December 2017 – May 2018
- Established large-scale production of PbS Quantum Dots using a microfluidic flow-based reactor
- Implemented Perovskite Quantum Dots for LCDs and UV detector applications

**Pitch Competitions:**

Pitched and won first place with an award of $26k in the 2018 MIT Enterprise Forum competition

**Droplab Inc**, Co-Founder / September 2016 – July 2017
- Developed a device for digitally manipulating fluid drops, involving high-voltage AC Signal Amplifiers and CNC machining
- Utilized material science principles to create hydrophobic and dielectric coatings controlled by voltage

**University of California, Berkeley,** Research Assistant at Prof. Alivisatos Group / January – August 2016
- Synthesized quantum dots and studied their photophysics dynamics using laser spectroscopy

**University of Toronto,** Research Assistant at Prof. Sargent Group / August 2014 – April 2015
- Designed a solar cell structure that achieved a record efficiency of 9.99% submitted in early 2016

**KAUST,** Research Assistant at Prof. Mohammed Group / January – April 2014
- Conducted research on optimal Donor-Acceptor organic molecules for LEDs
- Used Ultrafast Femtosecond Laser spectroscopy and spectrometers to study efficiency and stability

**University of Waterloo,** Research Assistant at Prof. Maheshwari Group / April – December 2013
- Built a single electron transistor using Gold Nanoparticles with Zinc Oxide nanowires as the gate electrode

## EDUCATION

**Doctor of Philosophy (PhD):** Materials Science and Engineering,
University of California, Berkeley, Supervisor: Alivisatos / January 2019 – May 2024

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

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