Dylan Bartusiak

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Education

Colorado School of Mines, Golden, CO

Major: Materials Science — **M.S. May 2019**

Major: Engineering Physics — **B.S. May 2016**
Minor: Energy

Work Experience

Senior Professional Research Assistant – CU Boulder NED Lab (Feb 2020 – Present)

- Lab Management: Chemical and lab supplies procurement, chemical handling and disposal, equipment troubleshooting and repair, equipment run logs, CAD in SolidWorks, resource scheduling, new user training, developing standard operating procedures
- Cleanroom Experience: JILA/Keck ISO 5/6 cleanroom, University of California Santa Barbara (UCSB) ISO 5/6 cleanroom, COSINC FAB cleanroom, Colorado School of Mines ISO 6 cleanroom
- Processing: contact lithography, stepper lithography, wet etching, reactive ion etching, inductively coupled plasma etching, ultrathin dielectric sputtering, thermal and e-beam evaporations of metals, profilometry, UV-Vis spectrometry, ellipsometry, TEM and SEM imaging, microscopy: optical, confocal, and deep UV, spectrophotometry, atomic force microscopy, photomask and reticle CAD design
- University of Colorado Systems: COSINC Resource Scheduler, JILA Equipment Booking System, CU Marketplace, BioRaft, Skillsoft, Concur

Process Engineer – CU Boulder Quantum Engineering Lab (Aug 2019 – Feb 2020)

- Developed standard operating procedures for the fabrication of micro and nano electronic devices including contact lithographic patterning, stepper patterning, material lift-off, wet and dry etching, sputtering of dielectrics, and metal evaporations
- Characterized and trouble shot existing procedures using ellipsometry, physical profilometry, and various microscopy techniques: optical, deep UV, confocal, scanning electron
- Performed fabrication work in the JILA/Keck cleanroom, UCSB cleanroom, and COSINC cleanroom
- Designed and completed studies of varying device structures to systematically improve upon and further understand the electronic characteristics of nano and microelectronic devices under development

Technical Skills and Professional Competencies

- **Laboratory:** Contact and stepper lithography, UV-Vis spectrometry, ellipsometry, TEM and SEM imaging, atomic force microscopy, wet and dry etching, thin film dielectric sputtering, chemical handling, equipment maintenance
- **Computer/Analytics:** SolidWorks, KLayout, Mathematica, Python, LaTeX, Literature Review, Microsoft Office: Word, Excel, PowerPoint
- **Communication:** Interdisciplinary Collaboration, Technical Writing, Oral Presentations
- **Strengths:** Hard and Diligent Worker, Quick Learner, Self-Motivated, Personable, Detail Oriented

Academic Engineering Project Experience

Microelectronics MOSFET design and production

- Built MOSFET device beginning with blank silicon wafers in Colorado School of Mines ISO 6 cleanroom
- Microelectronics processing including RCA cleaning, growing oxides, wet and dry etching, mask design, photolithography, and metallization, profilometry, ellipsometry, I-V characterization

Characterization of $CuInS_2$/ZnS Quantum Dots (QDs) and Thin Films – Master's Thesis

- Characterized optical properties of colloidal $CuInS_2$/ZnS QDs using photoluminescence, absorption, and FTIR spectroscopy. Optical properties of QD thin films were determined with ellipsometry and modeling
- Extracted core/shell QD dielectric function from absorbance measurements utilizing Kramers-Kronig transformations
- Imaged Langmuir Schaefer deposited monolayer and drop cast samples with TEM

Physics Field Session

- Vacuum system construction, thin film PVD, built laser systems, Lab-View interfacing, and digital logic
- Used LaTeX to program print ready publications
- Machined an air powered one-cylinder engine from raw materials