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EDUCATION

Colorado School of Mines, Golden, CO, Doctor of Philosophy, December 2019 (expected)
Cumulative GPA: 3.81/4.00

Georgetown University, Washington, DC, Bachelor of Science, Physics, May 2013, Cum Laude
Minor: Mathematics, Cumulative GPA: 3.49/4.00

Université de Genève, Geneva, Switzerland, Boston University Geneva Physics Program
January 2012 – August 2012, Semester of Physics courses taught in French, research at CERN

RESEARCH EXPERIENCE

Graduate Research Assistant, Colorado School of Mines
August 2014 – Present. Advisor: Brian Gorman and David Diercks

- CoorsTek funded research to study conducting ceramics with the goal of correlating electrical and chemical properties of individual grain boundaries in hydrogen separation membrane
- Understand nanoscale dopant segregation in epitaxial Cadmium Telluride Photovoltaics
- Ultimate goal of relating atomic scale results to device performance

Physicist, NIST / National Institute of Standards and Technology
January 2013 – August 2014. Advisor: Steven Hudson and John Royer

- Synthesize micron-sized ellipsoidal and peanut-shaped silica shells
- Purpose to examine anisotropic interactions in colloid suspensions and effect on rheology

Research Assistant, Georgetown University, Department of Physics, Senior Thesis Project
May 2011 – May 2013. Advisor: Edward Van Keuren

- Created and characterized co-crystal electron donor/acceptor nanoparticles
- Designed and fabricated organic field effect transistor to determine potential of nanoparticles in organic photovoltaics and organic electronics

Research Assistant, CERN / European Organization for Nuclear Research
March 2012 – August 2012. Advisor: Carlos Guerrero

- Analyzed data of gamma-ray detector response for ^{238}U neutron capture measurement
- Drafted “CERN Internal Note” on summary and analysis of neutron cross section measurements and evaluations of ^{235}U and ^{238}U in effort to improve current nuclear reactor efficiency and enable implementation of novel reactors

TEACHING EXPERIENCE

Teaching Assistant, Electron Microscopy Laboratory, Colorado School of Mines, Department of Metallurgy and Materials Engineering, January 2015 – Present. Manager: Robert Field

- In charge of training and upkeep of FEI Helios Nanolab 600i FIB-SEM and WiTec Alpha 300 R Confocal Raman Microscope

Teaching Assistant, MTGN 412, *Ceramics Engineering*, Colorado School of Mines, Department of Metallurgy and Materials Engineering, August 2014 – December 2014. Professor: Geoff Brennecka

- Graded homework and mentored students

Teaching Assistant, Physics 151 *Mechanics I*, Georgetown University, Department of Physics
August 2011 – December 2011. Professor: Amy Liu

- Provided interactive academic support to students during Tutorials and Office Hours
- Prepared teaching plan and strategies, graded homework and mentored students

FELLOWSHIPS AND HONORS

- CoorsTek Graduate Fellowship, January 2016-2018. CSM.
- Best Poster Award, Area 5: Characterization 2. IEEE PVSC Conference, 2016.
- Hands on Photovoltaic Experience (HOPE) Workshop, 2015. NREL
- Summer Undergraduate Research Fellowship (SURF), 2013. NIST
- Georgetown University Research Opportunity Program (GUROP), 2012. CERN
- Dean’s List (3.5 GPA or higher, Fall 2012; Second Honors (3.7 GPA or higher), Fall 2009

LABORATORY SKILLS

- Optical Analysis: UV-Vis and IR Spectroscopy, Dynamic Light Scattering
- Microscopy: Optical, Confocal Scanning, Transmission Electron, Scanning Electron, Focused Ion Beam, and Atom Probe Tomography
- Fluid Dynamics: Rheometer
- Nanofab: Lithography, CVC Sputtering, Parametric Analyzer/Probe Station, Temperature Dependent Hall Effect
- Synthesis: Lyophilizer, Centrifuge, Sonicator, Glove Box
- General: Breadboard, Oscilloscope

COMPUTER SKILLS

- Operating systems: Linux, Windows, and Macintosh
- Software: MATLAB, ImageJ, Mathematica, Vesta, IVAS, Origin, Latex, Excel, ROOT, IDL, Minitab
- Languages: C++

PUBLICATIONS

- Royer, John R., George L. Burton, Daniel L. Blair, and Steven D. Hudson. “Rheology and Dynamics of Colloidal Superballs.” *Soft Matter* 11, no. 28 (July 8, 2015): 5656-65.

INTELLECTUAL PROPERTY

Van Keuren, E., Burton, G., Nishida, M., Berk, C. 2013. “Charge Transfer Nano-co-crystals for Optical and Electronic Devices,” Georgetown University. International Patent Application No. PCT/US2014/067480 filed November 25, 2014.

PLATFORM PRESENTATIONS

Atom Probe Tomography and Microscopy (APT&M), “Atom Probe Tomography Study of BaCe_{0.8}Y_{0.2}O_{3-δ} – Ce_{0.8}Y_{0.2}O_{3-δ} Space Charge Regions,” Gyeongju, South Korea. June 14, 2016. Hyundai Hotel.

Microscopy and Microanalysis (M&M) Conference, “Dopant and Interfacial Analysis of Epitaxial CdTe Using Atom Probe Tomography,” Portland, OR. August 4, 2015. Oregon Convention Center.

Summer Undergraduate Research Fellowship Colloquium, “Synthesis and Microscopic Characterization of Anisotropic Colloids and Induced Depletion Interactions,” Gaithersburg, MD, August 8, 2013.

Georgetown Physics Department Senior Research Presentations, “Characterization of Organic Nanocrystal Charge Transfer Complexes and Their Application in Optical and Electronic Devices,” Washington, DC, May 1, 2013.

POSTER PRESENTATIONS

Rocky Mountain Chapter American Vacuum Society (RMCAVS) Symposium, “Nanoscale Characterization of $\text{BaCe}_{0.8}\text{Y}_{0.2}\text{O}_{3-\delta}$ – $\text{Ce}_{0.8}\text{Y}_{0.2}\text{O}_{3-\delta}$ Space Charge Layers,” Westminster, CO. September 22, 2016.

IEEE Photovoltaic Specialist Conference (PVSC), “Nanoscale Effect of Arsenic Incorporation in CdTe grown by Molecular Beam Epitaxy,” June 9, 2016. Portland, OR. Oregon Convention Center. Best Poster Award received.

7th Colorado Center for Advanced Ceramics (CCAC) Conference. August 21, 2015. Colorado School of Mines, Golden, CO.

NREL Hands-on PV Experience (HOPE) Workshop, Poster Session, July 22, 2015. Colorado School of Mines, Golden, CO.

Georgetown Undergraduate Science Research Fair, “Optical Characterization Laboratory,” Washington, DC, January 14, 2013.

OTHER EXPERIENCE

President and Co-founder, Mines Tiny House, Solar Decathlon Project, Colorado School of Mines. July 2015 – Present

- Lead a group of undergraduate and graduate students to eventually design, apply, build a net zero 800 sq. ft. home in two years for the Department of Energy Competition
- In preparation for competition, lead preparations to design and build Tiny House for students on campus to study renewable energy and the efficacy of energy efficiency measures

Treasurer, Materials Research Society (MRS), Colorado School of Mines. July 2015 – July 2016

- In charge of budget and financing of graduate student chapter
- Handled money and helped plan speakers, events, and informational sessions

Risk Manager, Club Tennis Team, Colorado School of Mines. July 2015 – Present

- In charge of safety, made sure all players were CPR certified

Co-Leader, Alternative Spring Break in Appalachia, Georgetown Center for Social Justice. October 2012 – March 2013, October 2010 – March 2011. *Volunteer*, February 2010 – March 2010

- Explored the effects of mountain top removal, discussed coal issues with community
- Lead participants in training events, on-site construction projects, cultural events, and reflection activities

Vice President of Initiatives, Georgetown Eco-Action. September 2012 – December 2012

- Raised awareness by organizing events such as Turn It Off! Drive and Recycling Audit

Tennis Professional, Georgetown Preparatory Tennis Club. June 2007 – August 2011

- Planned and directed tennis activities and drills to develop strokes, fitness and strategy
- Supervised Assistant Tennis Professionals, organized competitions, clinics, and events

PROFESSIONAL AFFILIATIONS

- Student Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, IEEE Electron Devices Society (EDS)
- Member, Materials Research Society (MRS)
- Member, Microanalysis Society (MAS)
- Member, Microscopy Society of America (MSA)
- Member, American Vacuum Society (AVS)
- Member, American Physical Society (APS)
- Member, Society for Physics Students (SPS)
- Member, National Society of Collegiate Scholars (NSCS)

LANGUAGES

- French (advanced speaking, reading, writing, comprehension)