Alexander J. Krejci, PhD

EDUCATION

PhD in Physics	Vanderbilt University – Nashville, TN	2013
MS in Physics	Vanderbilt University – Nashville, TN	2012
BS in Physics	University of Kansas – Lawrence, KS	2009

WORK EXPERIENCE

Teaching Assistant Professor, Faculty of Sciences and Humanities **February 2018 – Current**
SUNY Korea Incheon, Korea

- Teach energy, physics, and mathematics courses at the first American university in South Korea
- Created and presented a 5-part interactive module on conflict transformation
- Developed a solar array for deployment in agricultural settings

Research Assistant – Biological and Ecological Engineering **Sept 2016 – February 2018**
Oregon State University Corvallis, OR

- Designed and constructed weather vane with multiple environmental sensors including pressure, orientation, etc.
- Designed and created CAD models with 3D printing and laser cutting materials for unique mounting applications
- Studied principles of water resource engineering

Research Assistant Professor of Computer Science **Aug 2013 – Aug 2016**
SUNY Korea Incheon, Korea

- Created enjoyable yet highly challenging engineering physics courses focusing on student outcomes
- Founded a laboratory dedicated to enhancing undergraduate experience through product development
- Designing physics laboratories based on Arduino technology, an open-source physical computing platform
- Design experiment for 3D computational reconstruction of materials based on optical interactions
- Advised and challenged teaching assistants to enhance their understanding of the practice of teaching

Graduate Research Assistant **Aug 2009 – Aug 2013**
Vanderbilt University, Department of Physics & Brookhaven National Nashville, TN &
Laboratory & National Institute of Materials Science Upton, NY & Tsukuba, Japan

- Developed computational methods to analyze electron microscope images of nanoparticles
- Created new computer visualization techniques using Voronoi tessellations to analyze nanoparticle arrangements
- Created and computationally simulated new statistical measurement to analyze hexagonal packing of spheres
- Designed and built hardware and software for automated nanomaterial deposition system
- Published six first-author papers in physics, chemistry, material science and nanoscience journals
- Presented at multiple international, national, and local scientific conferences (see below)
- Recruited and mentored five undergraduate students, resulting in their co-authorship of four publications
- Initiated fruitful collaborations with scientists from Japan, from USA national labs, and from other universities

Mentor for Summer Interns **Summer 2013**
Brookhaven National Lab Upton, NY

- Worked intensively with three undergraduate students, training them in basic nanoscience techniques and educating them on scientific philosophy and ethics
- Trained students to use nanofabrication tools, monitored their safe usage of tools, and guided them in independent research projects

Graduate Teaching Affiliate **Summer 2011**
Brookhaven National Lab Upton, NY

- Attended an engaging, 2-week-long intensive training course on teaching strategies and techniques
- Trained 18 first-time teaching assistants on teaching strategies, school policy, and time management

Teaching Assistant – Physics **Aug 2009 – May 2011**
Vanderbilt University Nashville, TN

- Designed physics laboratories that inspired students to design and create their own experiments (18 labs total)
- Created Vanderbilt database system to share resources between past and future teaching assistants

Undergraduate Research Assistant – Environmental Engineering **Aug 2008 – Aug 2009**
University of Kansas Lawrence, KS

- Coauthored one journal publication and presented research at university conference
- Conducted environmental engineering experiments on pollutants from biodiesel

TRAINING

- **Mediation:** Completed 36-hour basic training
- **Programming:** C++, Mathematica, MATLAB, FORTRAN, Python, LabVIEW, PHP, MySQL, CSS, HTML
- **Software:** Fusion 360, Arduino, Microsoft Office, Origin, Adobe Creative Suite (Photoshop, Dreamweaver, Flash, Illustrator), LaTeX, Google Sketchup
- **Modeling:** HEC-HMS
- **Languages:** English – native, Spanish – working knowledge, Korean – basic knowledge

VOLUNTEER EXPERIENCE

- **SUNY Sensor Lab**, Founder and product developer 2015 – 2016
- **Web Developer and Master**, Buffalo Creek Farms, Apr 2005-**Current**
- **Ultimate Frisbee Coach**, Stony Brook University, Aug 2012 – May 2013

AWARDS AND GRANTS

- **IoT Dev. Grant**, NIPA, South Korea, 2015
- **Grants-in-aid of Research**, Sigma Xi, 2013
- **Summer Research Award**, Vanderbilt, 2013
- **Outstanding Publication Runner Up**, Vanderbilt Physics, 2012
- **Electrophoretic Deposition International Conf Award,** 2011
- **Outstanding Teaching Assistant**, Vanderbilt Physics, 2011
- **Robert T. Lagemann Exceptional Promise Award,** Vanderbilt Physics, 2011

EXTRACURRICULAR EXPERIENCE

- **Maker Faire Presenter,** presented product development work in Seoul & Beijing Maker Faires, 2015
- **Team Sports Instructor**, Lead a class on sports at SUNY Korea, 2014 – -2015
- **Sustainability House Director,** Run a sustainable living home, Lebanon, OR 2017-**Current**

PUBLICATIONS

- **A.J. Krejci**, A.M. Garcia, S. Sun, V.H. Pham, J.H. Dickerson, Comparing Highly Ordered Monolayers of Nanoparticles Fabricated Using Electrophoretic Deposition, J. Electrochem. Soc. *11* (2015) D3036-D3039
- **A.J. Krejci**, K. Yager, C. Ruggiero, J.H. Dickerson, X-ray Scattering as a Liquid and Solid Phase Probe of Ordering within Nanoparticles Fabricated by Electrophoretic Deposition, Nanoscale *6* (2014) 4047-4051
- **A.J. Krejci;** C.G.W. Thomas, J.H. Dickerson, Statistical assessment of order within systems of nanoparticles: determining the efficacy of patterned substrates to facilitate ordering within nanoparticle monolayers fabricated through electrophoretic deposition, Phys. Rev. E *87* (2013) 042307
- **A.J. Krejci;** C.G.W. Thomas; J. Mandal; I. Gonzalo-Juan; W. He; R. Stillwell; J. Park; D. Prasai; V. Volkov; K.I. Bolotin; J.H. Dickerson, Using Voronoi Tessellations to Assess Nanoparticle-Nanoparticle Interactions and Ordering in Monolayer Films Formed Through Electrophoretic Deposition, J. Physical Chemisty B *117* (2012) 1664-1669
- **A.J. Krejci**, T. Gebre, C.A. Ruggiero, M.D. Mochena, J.H. Dickerson, Kinetics of Monolayer and Bilayer Nanoparticle Film Formation During Electrophoretic Deposition, Advances in Applied Ceramics (2013)
- G.V. Shcherbatyuk, P Talbot, J Mandal, **A.J. Krejci**, J.H. Dickerson, S. Ghosh, Increased Photo-Stability of Quantum Dots in Segregated Bilayer Films, Journal of Applied Physics 114 (2013) 084305
- **A.J. Krejci**; J. Mandal; J.H. Dickerson, Patterned substrates to facilitate long-range ordering in the formation of nanoparticle monolayers by electrophoretic deposition, Applied Physics Letters 101 (2012) 043117-4.
- I. Gonzalo-Juan; **A.J. Krejci**; J.H. Dickerson, Toward Dynamic Control over TiO2 Nanocrystal Monolayer-by-Monolayer Film Formation by Electrophoretic Deposition in Nonpolar Solvents, Langmuir 28 (2012) 5295-5301.

- S. Somarajan; **A.J. Krejci**; W. He; D.S. Koktysh; J.H. Dickerson, Concentration dependence of the exchange interaction in lead europium sulfide nanocrystals, Solid State Communications 152 (2012) 161-164.
- **A.J. Krejci**; I. Gonzalo-Juan; J.H. Dickerson, Evolution of Ordering in Iron Oxide Nanoparticle Monolayers Using Electrophoretic Deposition, ACS Applied Materials & Interfaces 3 (2011) 3611-3615.
- W. He; **A. Krejci**; J. Lin; M.E. Osmulski; J.H. Dickerson, A facile synthesis of Te nanoparticles with binary size distribution by green chemistry, Nanoscale 3 (2011) 1523-1525.
- S.A. Hasan; J.L. Rigueur; R.R. Harl; **A.J. Krejci**; I. Gonzalo-Juan; B.R. Rogers; J.H. Dickerson, Transferable Graphene Oxide Films with Tunable Microstructures, Acs Nano 4 (2010) 7367-7372.
- J. Guo; E. Peltier; R.E. Carter; **A.J. Krejci**; S.M. Williams, Effects of biodiesel blending on gas-phase emissions from a heavy-duty engine, Abstracts of Papers of the American Chemical Society 238 (2009).
- A.L. Melott, **A.J. Krejci**, B.C. Thomas, M.V. Medvedev, G.W. Wilson, M.J. Murray, Atmospheric Consequences of Cosmic Ray Variability in the Extragalactic Shock Model, Journal of Geophysical Research 113 (2008) E10007.

PRESENTATIONS

- "WeatherShark: A light-weight weather station to swim through the skies," A.J. Krejci, J.M.L. Alcala, M. Nelke, J. Wagner, C. Udell, C.W. Higgins, J.S. Selker, Presented at **AGU Fall Meeting 2017** – New Orleans, LA December 14th 2017
- "Techniques for measuring order within NP monolayers," A.J. Krejci, Colin G.W. Thomas, J.H. Dickerson, Presented at **Gordon Conference on Self-Assembly and Supramolecular Chemistry** – Les Diablerets, Switzerland May 5th, 2013.
- "Techniques for measuring order within NP monolayers," A.J. Krejci, Colin G.W. Thomas, J.H. Dickerson, Presented at **MRS Spring Meeting** –San Francisco, CA April 6th, 2013.
- "Fabrication of Iron Oxide Nanoparticle Monolayers by Electrophoretic Deposition," A.J. Krejci, I. Gonzalo-Juan, J.H. Dickerson, Presented at **Young Research Symposium** – Brookhaven National Lab, Upton, NY November 30, 2012.
- "Fabrication of Iron Oxide Nanoparticle Monolayers by Electrophoretic Deposition," A.J. Krejci, I. Gonzalo-Juan, J.H. Dickerson, Presented at **APS March Meeting** 2012 – Boston, MA February 29, 2012.
- "Fabrication of 2-Dimensional Iron Oxide Nanoparticle Superlattices by Electrophoretic Deposition," A.J. Krejci, I. Gonzalo-Juan, J.H. Dickerson, Presented at the **4th International Conference on Electrophoretic Deposition** – Puerto Vallarta, Mexico October 4th, 2011.