

MUJAN N. SEIF

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RESEARCH INTERESTS

I am motivated to use both experimental and computational methods to fundamentally understand dislocation mechanisms in metals, alloys, and advanced structural materials

EDUCATION

University of Kentucky
B.S. Materials Science and Engineering

Lexington, KY
May 2017

Special Topics:

Integrated Computational Materials Education Summer School at the University of Michigan

A program focused on “educating the educators” of computational materials science, organized by Dr. Katsuyo Thornton (U. Michigan) and Dr. Mark Asta (UC Berkeley)

Applications of Mathematics in Materials Science and Engineering

An advanced elective course focusing on the mathematics that represent various phenomena in materials science including stress-assisted diffusion and surface stability, taught by Dr. Fuqian Yang

Capstone Design – Texture and Mechanical Properties in GE Aviation Titanium Alloys

The design of a visual tool that relates texture to the mechanical properties of titanium alloys; implemented EBSD, EDS, SE imaging, and nanoindentation throughout the project

Collegiate Leadership Institute sponsored by the Society of Women Engineers

A competitive-admission leadership institute that promotes networking between ambitious colleges students and accomplished professionals in STEM fields

Programming/Modeling Skills: Fortran, IDL, MATLAB, ANSYS, BASH, AutoCad, Creo

AWARDS

Senior Scholarship Award

ASM Bluegrass Chapter, 2017

Outstanding Materials Engineering Senior

CME Dept., University of Kentucky, 2017

Outstanding Materials Engineering Junior

CME Dept., University of Kentucky, 2016

Provost Scholarship

University of Kentucky, 2012-2016

Panhellenic Academic Excellence Award

University of Kentucky, 2014

PUBLICATIONS

C.-L. Park, H. Wang, **M.N. Seif**, S.A. Barnett, K. Thornton. “Microstructural Evolution of LSCF Cathode During Coarsening via Surface Diffusion”, in preparation

Mujan N. Seif, Matthew J. Beck. “A stochastic model for evaluating mechanical behavior of porous materials”, in preparation

Mujan N. Seif, Matthew J. Beck. “Shape Memory Polymers: A Joint Chemical and Materials Engineering Hands-On Experience”, accepted by *Chemical Engineering Education*

M.N. Seif. “My Life as a Brown Person.” *Arab Detroit 9/11: Life in the Terror Decade*. Ed. N. Abraham, S. Howell, A. Shyrook. Wayne State University Press, 2011. 213-220. Print.

PRESENTATIONS (* indicates presenter)

“*Insights into the Deformation of Nanoporous Gold using Scanning Nanobeam Diffraction*” T.J. Balk*, M.N. Seif, N.J. Briot, J. Ciston, T.C. Pekin, A.M. Minor. Materials Science & Technology, Pittsburgh, PA, October 2017.

RESEARCH EXPERIENCE

Research Assistant – Thornton Research Group, University of Michigan | *Ann Arbor, MI* *Present*

Coarsening of Complex Microstructures in Solid Oxide Fuel Cell Electrodes

- Phase field modeling – writing finite difference schemes to solve the Cahn-Hilliard equation surface diffusion as the dominant mode of transport

Strontium Segregation in Lanthanum Strontium Cobalt Ferrite (LSCF) SOFC Electrodes

- Improve a preliminary model that uses a combination of the diffusion equation and the Cahn-Hilliard equation in Smooth Boundary formulation

Undergraduate Research Assistant – Beck Research Group, University of Kentucky | *Lexington, KY* *Jan. – Aug. 2017*

Mechanical Properties of Nanoporous Silicon

- Calculated the stiffness of randomly oriented primitive structures for the underlying method of calculating approximations for the stiffness of complex structures
- Oversaw multiple undergraduate/high school students as they executed tasks as needed by the group [simple finite element calculations, compression testing, 3D printing]

Undergraduate Research Assistant – Balk Research Group, U. Kentucky | *Lexington, KY* *Jan. 2016 – Aug. 2017*

Gas Permeability of Fluoroelastomers for Parker Hannifin O-Ring Division

- Independently designed and built a vacuum apparatus to test gas permeability of o-ring elastomers
 - Built apparatus from spare vacuum components with few additional purchases
 - Gained experience with instrumentation absent from traditional MSE lab courses i.e. ion gauges, mechanical and turbo pumps, residual gas analyzers

Mechanical Properties of Nanoporous Materials

- Recorded a method for taking FIB-SEM images of np-Au, processing it with Avizo (visualization software), and eventually 3D printing a physical model of material
- Employed computational tools to model and analyze load and displacement values generated by nanoindentation of nanoporous silicon in an effort to characterize its viscoelastic nature

Course Assistant for Intro to MSE (advisor: Dr. Matthew J. Beck), U. Kentucky | *Lexington, KY* *Sept. – Dec. 2015*

- Developed a technique for initiating crosslinking in PMMA that utilizes an acrylic nail lamp
- Allowed for the development of a freshmen lab experience for over 150 students

Associate Investigator, DuPont Titanium (now the Chemours Company) | *New Johnsonville, TN* *Jan. – Dec. 2014*

- Designed and built a lab scale process that neutralizes waste by a more cost efficient method
- Evaluated a pilot process designed to remove contaminants from a major product stream

SYNERGISTIC ACTIVITIES

Vice President of Material Advantage *April 2016 – May 2017*

- Organized recruitment efforts aimed at first year engineering freshmen
 - Designed promotional items for distribution among incoming freshmen
 - Built and maintained organization's first website
 - Documented all actions as instructions to ease future officers' similar endeavors
- Wrote and updated the organization's first itemized budget and secured multiple source of funding
- Staged the MSE department's first internal resume workshop
- Organized the MSE program's first Senior Sendoff
- Oversaw organization's involvement in outreach events at grade schools in Lexington
- Coordinated and assigned various duties to other officers

Career Fair Chair of the Society of Women Engineers *April 2015 – May 2017*

- Improved employee registration to 100+ companies for the first time in event's history
- Coordinated 75+ student volunteers