

Kathlene Nicole Reeve

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816-824-4851

Objective

Currently seeking a PhD in Materials Engineering from Purdue University. Thesis research includes the thermodynamic analysis and mechanical enhancement of lead-free solder alloy systems. Other areas of interest include: solidification, powder metallurgy, electron microscopy, nuclear materials, and macroeconomics.

Education

Purdue University	West Lafayette, IN	August 2013-Present
▪ <i>Doctorate of Philosophy:</i>	Materials Engineering	▪ <i>Expected Graduation:</i> May 2017
		▪ <i>Cumulative GPA:</i> 3.94/4.0
Iowa State University	Ames, IA	August 2008-May 2013
▪ <i>Bachelor of Science Degree:</i>	Materials Engineering	▪ <i>Graduation Date:</i> May 2013
▪ <i>Degree Specializations:</i>	Metallic & Polymeric Materials	▪ <i>Cumulative GPA:</i> 3.33/4.0
▪ <i>Minor Degrees:</i>	Nuclear Engineering & Economics	▪ <i>Major Degree GPA:</i> 3.32/4.0

Employment

Purdue University	West Lafayette, IN
<i>Carol Handwerker's Research Group</i>	<i>Graduate Researcher</i>
	<i>August 2013-Present</i>
National Defense Science and Engineering Graduate (NDSEG) Fellowship sponsored thesis research, in collaboration with Ames Laboratory and Nihon Superior (Osaka, Japan), regarding lead-free solder alloy innovations. Thermodynamic analysis and statistical microstructural characterization of the effects of Al addition on Sn-Cu and Sn-Ag-Cu solders. The overarching goal being to provide mechanical improvements and lifetime extensions to lead-free solder joint systems.	
Ames National Laboratory/Iowa State University	Ames, IA
<i>Iver Anderson's Research Group</i>	<i>Research Associate</i>
	<i>March 2011-Present</i>
Current collaborative research concerning the thesis research efforts described above. Previous work in metallography and characterization of high temperature, lead-free solders and strengthened lead-free solder ball grid array (BGA) systems. Funding for BGA systems project during the spring of 2013 provided through the Science Undergraduate Laboratory Internship (SULI) program sponsored by the Department of Energy. Other previous research in permanent magnetic systems for rare-earth metal replacements, specifically the Al-Ni-Co system.	
<i>Scott Chumbley's Research Group</i>	<i>Research Assistant</i>
	<i>August 2010-May 2011</i>
Statistical & metallic characterization via optical topographic 3D imaging techniques of spent bullet casings for enhanced criminal investigatory procedures. Collaboration with the Iowa State Statistics Department during development of specially designed software packages for forensic procedures.	
<i>Mufit Akinc's Research Group</i>	<i>Research Assistant</i>
	<i>August 2009-May 2010</i>
Study of ceramic, $ZrO_2 + Y_2O_3$ zero-thermal expansion composites, infrared transmitting disk materials for use in military missile applications.	
<i>Nicola Bowler's Research Group</i>	<i>Research Assistant</i>
	<i>June 2008-May 2009</i>
Study & demonstrations of negative refractive index within the microwave frequency range by employing dielectric sphere array systems. Research experience produced a poster presentation at the Iowa Academy of Science conference and a submitted (unpublished) article to Applied Physics Letters.	
Honeywell Federal Manufacturing & Technology	Kansas City, MO
<i>Materials Engineering Department</i>	<i>Student Engineer III</i>
	<i>May 2012-August 2012</i>
Research & development on upcoming weapons systems, specifically work with polymer foam characterizations and a collaborative project with the University of Oklahoma concerning nano-fiber composite foam structures.	
<i>Rubber & Plastics Department</i>	<i>Student Engineer III</i>
	<i>May 2011-August 2011</i>
Research & development on syntactic, structural foams, for upcoming weapons systems, and engineering production support for day-to-day factory production.	
<i>Welding & Encapsulations</i>	<i>Student Engineer I</i>
	<i>May 2010-August 2010</i>
Laser weld development & qualifications, final product foam encapsulation support & development for day-to-day factory production, and lean manufacturing implementations.	

Employment (continued)

Iowa State University

Ames, IA

Material Science & Engineering Department Teaching Assistant

August 2012-December 2012

Graded assignments and provide course help for the senior level course, *Physical Metallurgy of Ferrous Alloys (MatE 443)*, taught by Dr. Ralph Napolitano.

Material Science & Engineering Department Peer Mentor

November 2009-May 2012

Supervised study sessions, classes, and events for incoming Materials Engineering freshman, helping them integrate into the Material Science and Engineering Department and college life in general.

Publications and Submissions

- **Journal of Electronic Materials** – Submitted for Publication (accepted, pending revisions): 2014
"The Nucleation and Growth of Cu-Al Intermetallics in Al-Modified Sn-Cu and Sn-Ag-Cu Lead-Free Solder Alloys"
 Authors: Kathlene Reeve, Iver Anderson, and Carol Handwerker
- **Applied Physics Letters** – Submitted for Publication (unpublished): 2009
"Experimental Demonstration of Negative Index of Refraction in an Array of Dielectric Spheres"
 Authors: Nicola Bowler, Kathlene Lindley, Yang Li, and Jin Liu

Conference Presentations and Co-Authors

- The Minerals, Metals, and Materials Society Conference (TMS): San Diego, CA, USA 2014
"The Nucleation and Growth of Cu₃₃Al₁₇ in Al-Modified Sn-Ag-Cu and Sn-Cu Lead-Free Solder Alloys"
 Authors: Kathlene Reeve*, Iver Anderson, and Carol Handwerker
- The Minerals, Metals, and Materials Society Conference (TMS): San Diego, CA, USA 2014
"Development of Pb-Free Composite Solder Paste to Replace High-Pb Hierarchical Solders"
 Authors: Iver Anderson* and Kathlene Reeve
- Materials Science and Technology Conference (MS&T) : Montreal, Quebec, Canada 2013
"Micro-alloying Effects on Joint Microstructures in Sn-Ag-Cu Solder Joints for High Reliability in Thermal Cycling and Thermal Aging"
 Authors: Iver Anderson*, Kathlene (Lindley) Reeve, Adam Boesenberg, and David Hillman

Poster Presentations

- TMS Pb-free Solders and Emerging Interconnect and Packaging Materials Poster Contest 2014
Awarded 2nd Place - San Diego, CA, USA
"Lead-Free Solder Alloy Mapping: The Nucleation and Growth of Cu₃₃Al₁₇"
- Material Advantage Undergraduate Poster Contest – MS&T: Montreal, Canada 2013
"Lead-Free Solder Alloy Mapping: The Nucleation and Growth of Cu₃₃Al₁₇"
- Iowa State University's Material Science and Engineering Department Student Poster Competition: 2013
"Lead-Free Solder Alloy Mapping: The Nucleation and Growth of Cu₃₃Al₁₇"
Awarded 1st Place in the Undergraduate Research Division
- Iowa State University's Material Science and Engineering Department Student Poster Competition: 2012
"Properties and Performance of TEPIC Foam"
- Iowa Academy of Science Conference, Student Poster Presentations: 2009
"Design of Coated Spheres for Negative Refractive Index in a Meta-Film at Microwave Frequencies"

Fellowships & Scholarships

- National Defense Science and Engineering Graduate (NDSEG) Fellowship 2014-2017
Full tuition and stipend funding for three year PhD program
- Ross Fellowship – Purdue University 2013-2014
- American Ceramics Society (Acer's) Nuclear & Environmental Technologies Division (NETD) Student Stipend Award 2013
- American Society of Materials (ASM) George A. Roberts Scholarship 2012-2013
- John Deere Metallurgy Fellowship 2012-2013

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Fellowships & Scholarships (continued)

▪ American Ceramics Society (Acer's) Nuclear & Environmental Technologies Division (NETD) Student Stipend Award	2012
▪ Materials Science & Engineering Department Scholarship	2011-2012
▪ Iowa State University's Award for Competitive Excellence	2008-2012
▪ American Ceramics Society (Acer's) Nuclear & Environmental Technologies Division (NETD) Student Stipend Award	2011
▪ John Deere Metallurgy Fellowship	2010-2011
▪ Beem Patent Law Firm Scholarship	2009-2010
▪ Iowa State University's College of Engineering Scholarship	2008-2009
▪ Dobson PRIDE Scholarship	2008-2009
▪ American Legion Auxiliary Unit 25 Scholarship	2008-2009
▪ Jerry Litton Scholarship Award	2008-2009
▪ Olive Prindle Scholarship	2008-2009

Design Awards

▪ Materials Challenges in Alternative and Renewable Energies (MCARE) <i>Awarded "Most Innovative" Design</i>	2012
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Leadership & Honors

▪ Purdue Graduate Student Government Member	2013-Present
▪ Purdue University Graduate Mentoring Program Member	2013-Present
▪ Purdue University MSE Graduate Student Association Member	2013-Present
▪ Iowa State University's MSE Student Leadership and Service Award	2013
▪ Iowa State University's Dean's List	2009, 2011-2013
▪ Iowa State University's Learning Community " <i>Outstanding Peer Mentor</i> "	2009-2012
▪ Material Advantage Member	2009-2013
➢ Iowa State Chapter: President (2010-11), Fundraising Chair (2009-10)	
▪ Iowa State University's Honor Program Freshman Seminar Leader	2009
➢ Taught an Honors Program orientation course for freshman Iowa State students	
▪ Iowa State University's Honors Program	2008-2010

Government Holdings

▪ United States Department of Energy " <i>Q-Level</i> " Security Clearance	2010-2012
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Skills

▪ Metallographic sample preparation for characterization via optical microscopy, SEM, and TEM analysis	
▪ Proficiency concerning the following techniques and equipment:	
➢ Optical/Stereo microscope, SEM, DSC, DMA, TMA, TGA, XRD, Instron tensile tester, Rockwell hardness tester, microhardness tester, rheometer, & polymer production and extrusion techniques and equipment	
▪ Software & Programming:	
➢ Thermo-Calc, MATLAB, Mathcad, MiniTab, JMP, ImageJ, MCNP Code for nuclear processes, SolidWorks, and Microsoft Office	

Conference Attendances

▪ The Minerals, Metals, and Materials Conference	San Diego, CA	2014
▪ Material Science and Technology Conference	Montreal, Canada	2013
▪ Material Advantage Congressional Visit Days	Washington D.C.	2013
▪ Materials Science and Technology Conference	Pittsburgh, PA	2012
▪ Materials Challenges in Alternative & Renewable Energies Conference	Clearwater, FL	2012

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Conference Attendances (continued)

▪ Materials Science and Technology Conference	Columbus, OH	2011
▪ The Minerals, Metals, and Materials Conference	San Diego, CA	2011
▪ Materials Science and Technology Conference	Houston, TX	2010
▪ The Minerals, Metals, and Materials Conference	Seattle, WA	2010
▪ Materials Science and Technology Conference	Pittsburgh, PA	2009
▪ Iowa Academy of Science Conference	Des Moines, IA	2009