

## CURRICULUM VITAE

### Janelle P. Wharry

Assistant Professor  
School of Nuclear Engineering  
Purdue University  
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## NATIVITY

Citizenship - United States of America  
Birthplace - Hilo, Hawaii  
Languages - English (native), Japanese (beginner)

## EDUCATION

**Ph.D.**, Nuclear Engineering & Radiological Sciences  
**University of Michigan**, Ann Arbor MI, 2012  
*Thesis:* The Mechanism of Radiation-Induced Segregation in Ferritic-Martensitic Steels  
*Chair:* Gary S. Was

**M.S.E.**, Nuclear Engineering & Radiological Sciences  
**University of Michigan**, Ann Arbor MI, 2005

**B.S.E.**, *magna cum laude*, Nuclear Engineering & Radiological Sciences, Mathematics minor  
**University of Michigan**, Ann Arbor MI, 2004

## APPOINTMENTS

**Assistant Professor**, School of Nuclear Engineering  
**Purdue University**, West Lafayette IN, as of August 2016

Principal investigator of Micromechanics of Irradiated Materials Group. Graduate and undergraduate research mentorship and teaching.

**Assistant Professor**, Micron School of Materials Science & Engineering  
**Boise State University**, Boise ID, 2013-2016

Principal investigator with total research portfolio ~\$4M in external grants, contracts, and research agreements. Graduate and undergraduate research mentorship. Graduate and undergraduate teaching in the Materials Science & Engineering and Engineering Sciences departments.

### Affiliate Faculty

**Center for Advanced Energy Studies**, Idaho Falls ID, 2014-2016

Affiliate of multi-institutional research partnership in Idaho and Wyoming. Led development of TEM *in situ* mechanical testing capabilities at CAES.

**Research Fellow**, Nuclear Engineering & Radiological Sciences  
**University of Michigan**, Ann Arbor MI, 2012

Focused on high-dose ( $\geq 100$  dpa) irradiation effects in ferritic/martensitic alloys using self-ion irradiation. Investigated the effects of damage rate on microstructure evolution, precipitation, and microchemical segregation.

**Research Assistant**, Nuclear Engineering & Radiological Sciences  
**University of Michigan**, Ann Arbor MI, 2007-2012

Developed coupled experimental-modeling approach to determine the mechanism of radiation-induced segregation (RIS) in ferritic/martensitic alloys. Investigated relationship of RIS with phase stability and microstructure evolution. Gained expertise in charged particle irradiations and implantation, Fortran and Matlab, TEM, focused ion beam (FIB), and thin film deposition.

**Intern**, Radioactive Materials Transportation Testing & Analysis  
**Sandia National Laboratory**, Albuquerque NM, 2004-2005

Developed models for airborne radioactive particulate dispersal and economic impact for RADTRAN, a computer code for risk assessment of the transportation of radioactive materials. Contributed to thermo-mechanical modeling of spent fuel casks during impact.

**Nuclear Engineer**, Oconee Nuclear Design Group  
**Duke Energy**, Charlotte NC, 2006-07

Performed core design and related reactor physics support calculations and analyses for three Oconee pressurized water reactor units. Neutron physics modeling and thermal and safety analyses for proposed new fuel assembly design. Developed and implemented improved zero power physics test methods for cycle startup.

**Intern**, Radiation Measurement & Analysis Group  
**Westinghouse Electric Company**, Monroeville PA, 2003

Developed normalized pin power distributions from all Westinghouse 16x16 217-assembly pressurized water reactor cores to streamline irradiation dose and lifetime calculations for in-core radiation flux monitors.

**Intern**, Department of Water Supply  
**County of Hawaii**, Hilo HI, 2002

Utilized ultrasonic and other non-destructive techniques to measure water pressure and flow rates for leak detection throughout the County of Hawaii's water pump stations.

**RESEARCH GRANTS, AGREEMENTS, & CONTRACTS**

1. Center for Advanced Energy Studies (CAES) and Idaho National Laboratory (INL) Laboratory Directed Research and Development (LDRD). *Microscale technique to evaluate grain boundary cohesion of irradiated alloys*. 2016-2019. \$900,000 (\$150,000 to JPW). Co-PI (PI Xianming (David) Bai; Co-PIs Wen Jiang, Ray Fertig, Indrajit Charit).
2. US Department of Energy Office of Nuclear Energy (DOE-NE) and Nuclear Science User Facilities (NSUF). *TEM in situ microcantilever testing of irradiated F/M alloys*. 2016. \$50,000. PI.
3. DOE-NE NSUF. *Understanding the effects of irradiation dose rate and particle type in ferritic/martensitic alloys*. 2016. \$50,000. Co-PI (PI Matthew Swenson).
4. Electric Power Research Institute. *Creep rupture mechanisms of PM-HIP and cast CF8C-Plus alloy*. 2015-2016. \$46,000. PI.

5. DOE-NE NSUF. *Irradiation influence on alloys fabricated by powder metallurgy and hot isostatic pressing for nuclear applications*. 2015-2022. \$2,000,000. PI (Co-PIs David Gandy, Assel Aitkaliyeva).
6. National Aeronautics and Space Administration (NASA) EPSCoR. *Utilizing radiation induced segregation to enhance the strength of metal matrix composites*. 2015-2016. \$25,000. PI.
7. DOE-NE NSUF. *Characterizing Si-Ni-Mn clustering in ion irradiated Fe-9Cr ODS alloy*. 2015. \$50,000. PI.
8. DOE-NE NSUF. *Proton irradiations of alloys fabricated by powder metallurgy and hot isostatic pressing*. 2015. \$50,000. PI.
9. National Science Foundation (NSF). *CER: Understanding how irradiation affects electrochemical charge storage in nanostructured metal oxide electrodes*. 2014-2017. \$200,000 (\$100,000 to JPW). Co-PI (PI Hui Xiong, Co-PI Darryl Butt).
10. US Nuclear Regulatory Commission (NRC). *A faculty development program in materials for nuclear energy systems at Boise State University*. 2014-2017. \$430,000. PI (Co-PIs Darryl Butt, Peter Mullner).
11. DOE-NE NSUF. *Si-Ni-Mn clustering in irradiated Fe-9Cr oxide dispersion strengthened alloy*. 2014. \$50,000. PI.
12. DOE-NE NSUF. *Correlating mechanical properties with microstructure evolution in irradiated F/M and ODS alloys*. 2014. \$50,000. PI.
11. DOE-NE NSUF. *Irradiation-induced segregation, phase stability, and microstructure in 8-10 wt% Cr ODS alloys*. 2014. \$50,000. PI.
12. DOE-NE NSUF. *Toward an understanding of the effect of dose rate on the irradiation response of F/M alloys*. 2013. \$50,000. PI.
13. Pacific Northwest National Laboratory. *Focused ion beam milling of TEM samples from ion-irradiated ferritic-martensitic steels*. 2013. \$4,000. PI.

## PUBLICATIONS

1. K.H. Yano, M.J. Swenson, and J.P. Wharry. *Preparation, testing, and analysis of in situ TEM microcompression pillars from bulk irradiated specimens*. Manuscript in preparation.
2. M.J. Swenson, C.K. Dolph, and J.P. Wharry. *The effects of oxide evolution on mechanical properties in irradiated 9wt% Cr ODS alloy*. Submitted manuscript.
3. C.K. Dolph, M.J. Swenson, and J.P. Wharry. *Plastic zone size for nanoindentation of irradiated Fe-9wt% Cr ODS alloy*. Submitted manuscript.
4. M.J. Swenson and J.P. Wharry. *The comparison of microstructure and nanocluster evolution in proton and neutron irradiated Fe-9%Cr ODS steel to 3 dpa at 500°C*. *Journal of Nuclear Materials* 467 (2015) 97.
5. C.M. Parish, K.G. Field, A.G. Certain, and J.P. Wharry. *Application of STEM characterization for investigating radiation effects in BCC Fe-based alloys*. *Journal of Materials Research* 30 (2015) 1275.

6. T.R. Allen, D. Kaoumi, J.P. Wharry, Z. Jiao, C. Topbasi, A. Kohnert, L. Barnard, A. Certain, K. Field, G.S. Was, D.L. Morgan, A.T. Motta, B.D. Wirth, and Y. Yang. *Characterization of microstructure and property evolution in advanced cladding and duct: Materials exposed to high dose and elevated temperature*. Journal of Materials Research 30 (2015) 1246.
7. J.P. Wharry and G.S. Was. *The mechanism of radiation-induced segregation in ferritic-martensitic alloys*. Acta Materialia 65 (2014) 42.
8. J.P. Wharry and G.S. Was. *A systematic study of radiation-induced segregation in ferritic-martensitic alloys*. Journal of Nuclear Materials 442 (2013) 7.
9. Y. Huang, J.P. Wharry, Z. Jiao, C.M. Parish, S. Ukai, T.R. Allen. *Microstructural evolution in proton irradiated NF616 at 773 K to 3 dpa*. Journal of Nuclear Materials, 442 (2013) S800.
10. J.P. Wharry, Z. Jiao, and G.S. Was. *Application of the Inverse Kirkendall model of radiation-induced segregation to ferritic-martensitic alloys*. Journal of Nuclear Materials, 425 (2012) 117.
11. J.P. Wharry, Z. Jiao, V. Shankar, J.T. Busby, and G.S. Was. *Radiation-induced segregation and phase stability in ferritic-martensitic alloy T91*. Journal of Nuclear Materials, 417 (2011) 140.
12. G.S. Was, J.P. Wharry, B. Frisbie, B.D. Wirth, D. Morgan, J.D. Tucker, and T.R. Allen. *Assessment of radiation-induced segregation mechanisms in austenitic and ferritic-martensitic alloys*. Journal of Nuclear Materials, 411 (2011) 41.

## CONFERENCE PAPERS & PROCEEDINGS

1. J.P. Wharry, K.H. Yano, M.J. Swenson, and Y.Q. Wu. *In situ TEM mechanical testing: an emerging approach for characterization of polycrystalline, irradiated alloys*. Microscopy & Microanalysis 2016. Submitted. INVITED
2. M.J. Swenson and J.P. Wharry. *Collected data set size considerations for atom probe cluster analysis*. Microscopy & Microanalysis 2016. Submitted.
3. K.H. Yano, M.J. Swenson, and J.P. Wharry. *In situ TEM microcompression pillar size effects in Fe-9Cr ODS*. Transactions of the American Nuclear Society – 2016 Annual Meeting and Embedded Topical Meeting: Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors. Submitted.
4. M.J. Swenson and J.P. Wharry. *Comparison of Ion and Neutron Irradiations to 3 dpa at 500°C in Ferritic-Martensitic Alloys*. Transactions of the American Nuclear Society – 2016 Annual Meeting and Embedded Topical Meeting: Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors. Submitted.
5. J.P. Wharry, M.J. Swenson, and C.K. Dolph. *Evolution of yield strength of Fe-9%Cr ODS under neutron and ion irradiation*. Transactions of the American Nuclear Society – 2016 Annual Meeting and Embedded Topical Meeting: Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors. Submitted. **INVITED**
6. M.J. Swenson, C. Dolph, J.P. Wharry. *Correlation between the microstructure and mechanical properties of irradiated Fe-9Cr ODS*. Transactions of the American Nuclear Society – 2014 Annual Meeting and Embedded Topical Meeting: Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors, 110 (2014) 421.

7. J.P. Wharry. *Radiation-induced segregation and phase stability in ferritic-martensitic alloys*. Transactions of the American Nuclear Society and Embedded Topical Meeting Isotopes for Medicine and Industry, 103 (2010) 85.
8. S. Choudhury, L. Barnard, D. Morgan, K. Field, T. Allen, J.P. Wharry, Z. Jiao, G. Was, and B. Wirth. *Radiation induced segregation in ferritic-martensitic steels*. Transactions of the American Nuclear Society and Embedded Topical Meeting Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors, 102 (2010) 715-716.
9. Z. Jiao, V. Shankar, J. Wharry, and G. Was. *Phase stability in proton and heavy ion irradiated ferritic-martensitic alloys*. Transactions of the American Nuclear Society and Embedded Topical Meeting Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors, 102 (2010) 824-825.
10. Z. Jiao, J. Penisten (maiden name), G. Was, and R. Martens. *Atom probe tomography of radiation-induced precipitation in ferritic-martensitic alloy HCM12A*. Microscopy & Microanalysis, 15 (2009) 1374-1375.
11. J. Penisten (maiden name) and J.M. Sanders. *A post-processing method for control rod worth measurements at Oconee Nuclear Station*. Transactions of the American Nuclear Society, 96 (2007) 623-624.
12. J. Penisten (maiden name), E.L. McAndrew-Benavides, S.L. Chisholm, and A.W. Strange. *Recruitment, development, and retention in the nuclear industry: a survey of young professionals*. Transactions of the American Nuclear Society, 96 (2007) 17-18.
13. J. Penisten (maiden name) and R.F. Weiner. *Improved resuspension dose model for RADTRAN transportation risk-assessment code*. Transactions of the American Nuclear Society, 93 (2005) 155-156.
14. M.L. Dennis, J. Penisten (maiden name), and R.F. Weiner. *Implementing a Monte Carlo sampling interface for RADTRAN*. Transactions of the American Nuclear Society, 93 (2005) 157-158.
15. R.F. Weiner, J. Penisten (maiden name), and K.J. Kearfott. *Atmospheric dispersion model for RADTRAN*. Electronic Proceedings of the 46<sup>th</sup> Annual Meeting of the Institute of Nuclear Materials Management (2005).
16. J. Penisten (maiden name) and R.F. Weiner. *An economic model of a radioactive materials transportation accident for the RADTRAN risk assessment code*. Proceedings of Waste Management Conference (2005).

#### OTHER AUTHORSHIP

1. J. Penisten (maiden name), T. Cheatham, E. McAndrew-Benavides, S.L. Chisholm, and A.W. Strange. *2006 Recruitment & Retention Benchmarking Survey Report*. North American Young Generation in Nuclear, November 2006.
2. D. Hinojosa, J. Penisten (maiden name), M.L. Dennis, D.M. Osborn, R.F. Weiner, T.J. Heames, and M.K. Marincel. *RADCAT 3.0 User Guide*. Sandia National Laboratories, Albuquerque NM and Livermore CA, May 2009. DOI 10.2172/984940.
3. R.F. Weiner, D.M. Osborn, D. Hinojosa, T.J. Heames, J. Penisten (maiden name), and D. Orcutt. *RADCAT 2.3 User Guide*. Sandia National Laboratories, Albuquerque NM and Livermore CA, September 2006.

## CONFERENCE PRESENTATIONS

1. K.H. Yano and J.P. Wharry. *TEM in situ cantilever testing to assess grain cohesion in irradiated ODS*. Materials Science & Technology (MS&T) 2016, Salt Lake City UT, scheduled October 2016.
2. M.J. Swenson and J.P. Wharry. *Cluster evolution in F/M alloys upon neutron, proton, and self-ion irradiation*. Materials Science & Technology (MS&T) 2016, Salt Lake City UT, scheduled October 2016.
3. J.P. Wharry, K.H. Yano, M.J. Swenson, and Y.Q. Wu. *In situ TEM mechanical testing: an emerging approach for characterization of polycrystalline, irradiated specimens*. Microscopy & Microanalysis 2016 Meeting, Columbus OH, scheduled July 2016. **INVITED**
4. M.J. Swenson and J.P. Wharry. *Collected data set size considerations for atom probe cluster analysis*. Microscopy & Microanalysis 2016 Meeting, Columbus OH, scheduled July 2016.
5. K.H. Yano, M.J. Swenson, and J.P. Wharry. *In situ TEM microcompression pillar size effects in Fe-9Cr ODS*. Nuclear Fuels & Structural Materials Embedded Topical, American Nuclear Society Annual Meeting, New Orleans LA, scheduled June 2016.
6. M.J. Swenson and J.P. Wharry. *Comparison of ion and neutron irradiations to 3 dpa at 500°C in ferritic/martensitic alloys*. Nuclear Fuels & Structural Materials Embedded Topical, American Nuclear Society Annual Meeting, New Orleans LA, scheduled June 2016.
7. J.P. Wharry, M.J. Swenson, and C.K. Dolph. *Evolution of yield strength of Fe-9%Cr ODS under neutron and ion irradiation*. Nuclear Fuels & Structural Materials Embedded Topical, American Nuclear Society Annual Meeting, New Orleans LA, scheduled June 2016. **INVITED**
8. M.J. Swenson and J.P. Wharry. *Comparison of neutron, proton, and self-ion irradiation of Fe-9%Cr ODS at 3 dpa, 500°C*. The Minerals, Metals & Materials Society Annual Meeting, Nashville TN, March 2016.
9. M. Lepule and J.P. Wharry. *Effects of irradiation on the interfacial reaction of RF magnetron sputtered SiC and ODS steels*. The Minerals, Metals & Materials Society Annual Meeting, Nashville TN, March 2016.
10. K. Smith, H. Xiong, J.P. Wharry, and D.P. Butt. *Defect Driven Titania Anode for Secondary Sodium and Lithium Batteries*. Electronic Materials and Applications 2016, American Ceramic Society, Orlando FL, January 2016.
11. J.P. Wharry, M.J. Swenson and C.K. Dolph. *Influence of irradiation particle and dose rate on strengthening mechanisms of model ODS alloy*. International Conference on Plasticity, Kailua-Kona HI, January 2016. **INVITED**
12. M.J. Swenson and J.P. Wharry. *Irradiation effects on the mechanical properties of an Fe-9%Cr oxide dispersion strengthened alloy*. P3 Meeting, Center for Advanced Energy Studies, Idaho Falls ID, December 2015. **INVITED**
13. C.K. Dolph, D.J. Da Silva\*, and J.P. Wharry. *Effective strain hardening coefficient for irradiated 9wt% Cr ODS alloy by nano-indentation and TEM*. Materials Research Society Fall Meeting, Boston MA, December 2015. \*undergraduate author
14. J.P. Wharry, M.J. Swenson, and C.K. Dolph. *Modeling irradiation hardening in oxide dispersion strengthened steels*. Center for Advanced Energy Studies (CAES) Materials, Modeling, Simulation, and Visualization Workshop, McCall ID, May 2015. **INVITED**

15. J.P. Wharry, M.J. Swenson, and C.K. Dolph. *Comparison of proton and neutron irradiation effects in ODS and F/M alloys*. 57<sup>th</sup> Idaho Academy of Science and Engineering (IASE) Annual Meeting and Symposium, Boise ID, March 2015. **INVITED**
16. M.J. Swenson and J.P. Wharry. *The strengthening mechanism transition in nanofeatured ferritic-martensitic alloys*. The Minerals, Metals & Materials Society Annual Meeting, Orlando FL, March 2015. **Received Best Poster Award.**
17. J.P. Wharry, A.M. Monterrosa, and G.S. Was. *Radiation-induced segregation at high doses in self-ion irradiated F/M alloys*. The Minerals, Metals & Materials Society Annual Meeting, Orlando FL, March 2015.
18. J.P. Wharry, M.J. Swenson, and C.K. Dolph. *Microstructure-mechanical property relationship in self-ion irradiated ODS and F/M alloys*. European Materials Research Society, Warsaw, Poland, September 2014. **INVITED**
19. J.P. Wharry, M.J. Swenson, and C.K. Dolph. *On the relationship between sink strength and irradiation hardening in an ODS steel*. XXIII International Materials Research Congress (IMRC 2014), Cancún, Mexico, August 2014. **INVITED**
20. M.J. Swenson, C.K. Dolph, and J.P. Wharry. *Correlation between the microstructure and mechanical properties of irradiated Fe-9Cr ODS*. American Nuclear Society Annual Meeting, Reno NV, June 2014.
21. J.P. Wharry, A.M. Monterrosa, and G.S. Was. *Dose rate functionality of radiation-induced segregation in F/M alloys: protons and self-ions*. Workshop on Ion Beam Simulation of High Dose Neutron Irradiation, Ann Arbor MI, April 2014. **POSTER**
22. M.J. Swenson, C.K. Dolph, and J.P. Wharry. *Correlation between the microstructure and mechanical properties of irradiated Fe-9Cr ODS*. P3 Meeting, Center for Advanced Energy Studies, Idaho Falls ID, April 2014. **INVITED**
23. G.S. Was, Z. Jiao, E. Beckett, A. Monterrosa, J. Wharry, S. Maloy, O. Anderoglu, and M. Hackett. *Emulation of high dose reactor irradiations of F-M alloys using self-ions*. The Minerals, Metals & Materials Society Annual Meeting, San Diego CA, March 2014.
24. J.P. Wharry, C. Dolph, P. Hosemann, J. Nielsen, and P. Davis. *Irradiation-induced microstructure and mechanical property evolution in an Fe-9Cr ODS alloy*. 8<sup>th</sup> International Conference on Processing & Manufacturing of Advanced Materials (THERMEC), Las Vegas NV, December 2013. **INVITED**
25. J.P. Wharry, A.M. Monterrosa, and G.S. Was. *Radiation-induced segregation in ferritic-martensitic alloys at high doses and high dose rates*. 16<sup>th</sup> International Conference on Fusion Reactor Materials (ICFRM-16), Beijing, China, October 2013. **POSTER**
26. G.S. Was, Z. Jiao, E. Beckett, A. Monterrosa, J. Wharry, S. Maloy, M. Hackett. *Self-ion irradiation simulation of high dose reactor irradiations of F-M alloys: recent results*. 16<sup>th</sup> International Conference on Fusion Reactor Materials (ICFRM-16), Beijing, China, October 2013.
27. J.P. Wharry and G.S. Was. *The mechanism of radiation-induced segregation in ferritic-martensitic alloys*. The Minerals, Metals & Materials Society Annual Meeting, San Antonio TX, February 2013.
28. G.S. Was, Z. Jiao, E. Beckett, K. Sun, and J. Wharry. *Microstructures of F-M alloys at very high doses*. The Minerals, Metals & Materials Society Annual Meeting, San Antonio TX, February 2013.

29. J. Michalička, Z. Jiao, J.P. Wharry, and G.S. Was. *High dose heavy ion irradiation of austenitic stainless steels simulating a neutron irradiation*. The Minerals, Metals & Materials Society Annual Meeting, San Antonio TX, February 2013.
30. Z. Jiao, J. Wharry, G. Yu, and G.S. Was. *High dose microstructures in ferritic-martensitic alloys*. 15<sup>th</sup> International Conference on Fusion Reactor Materials (ICFRM-15), Charleston SC, 2011. **INVITED**
31. J.P. Wharry, Z. Jiao, and G.S. Was. *Application of Inverse Kirkendall model of radiation-induced segregation to ferritic-martensitic alloys*. The Minerals, Metals & Materials Society Annual Meeting, San Diego CA, 2011.
32. B. Frisbie, B.D. Wirth, J.P. Wharry, and G.S. Was. *Kinetic Lattice Monte Carlo simulations of radiation induced segregation of chromium in ferritic-martensitic steels*. The Minerals, Metals & Materials Society Annual Meeting, San Diego CA, 2011.
33. J.P. Wharry and G.S. Was. *Radiation-induced segregation and phase stability in ferritic-martensitic alloys*. Special session for the Innovations in Fuel Cycle Research Awards Program, American Nuclear Society 2010 Winter Meeting, Las Vegas NV, 2010. **INVITED**
34. Z. Jiao, J.P. Wharry, G.S. Was, C. Ling, and A. Van der Ven. *Ni-Si phases in irradiated austenitic steels*. Materials Research Society Fall Meeting, Boston MA, 2010.
35. Z. Jiao, J. Michalička, J.P. Wharry, and G.S. Was. *Irradiated microstructure of austenitic and ferritic-martensitic steels at high fluences*. Materials Science & Technology, Houston TX, 2010.
36. G.S. Was, J.P. Wharry, and B. Wirth. *Radiation-induced segregation in austenitic and ferritic-martensitic steels*. 12<sup>th</sup> International Conference on Modern Materials and Technologies (CIMTEC), 5<sup>th</sup> Forum on New Materials, Montecatini Terme, Italy, 2010. **INVITED**
37. Z. Jiao, V. Shankar, J.P. Wharry, and G.S. Was. *Phase stability in proton and heavy ion irradiated ferritic-martensitic alloys*. Nuclear Fuels and Structural Materials for Next Generation Nuclear Reactors, Embedded Topical in American Nuclear Society Annual Meeting, San Diego CA, 2010.
38. Z. Jiao, V. Shankar, J.P. Wharry, and G.S. Was. *Irradiation microstructure and hardening in ferritic-martensitic alloys*. Nuclear Fuels and Structural Materials for Next Generation Nuclear Reactors, Embedded Topical in American Nuclear Society Annual Meeting, San Diego CA, 2010. **POSTER**
39. S. Choudhury, L. Bernard, D. Morgan, K. Field, T. Allen, J. Wharry, Z. Jiao, G. Was, and B. Wirth. *Radiation-induced segregation in ferritic/martensitic steels*. Nuclear Fuels and Structural Materials for Next Generation Nuclear Reactors, Embedded Topical in American Nuclear Society Annual Meeting, San Diego CA, 2010.
40. J.P. Wharry. *Radiation-induced segregation and phase stability in candidate alloys for the Advanced Burner Reactor*. American Nuclear Society Student Conference, Ann Arbor MI, 2010.
41. Z. Jiao, J.P. Wharry, V. Shankar, G.S. Was, and J.T. Busby. *Radiation-induced segregation and phase stability in ferritic-martensitic alloys*. 14<sup>th</sup> International Conference on Fusion Reactor Materials (ICFRM-14), Sapporo, Japan, 2009. **INVITED**
42. Z. Jiao, J.P. Wharry, G.S. Was, and R.L. Martens. *Atom probe tomography of radiation-induced precipitation in ferritic-martensitic alloy HCM12A*. Microscopy & Microanalysis Meeting, Richmond VA, 2009.
43. J. Penisten (maiden name), Z. Jiao, and G.S. Was. *Radiation-induced segregation in ferritic-martensitic alloys HT9, T91, and HCM12A*. The Minerals, Metals & Materials Society Annual Meeting, San Francisco CA, 2009.



44. J. Penisten (maiden name) and J.M. Sanders. *A post-processing method for control rod worth measurements at Oconee Nuclear Station*. American Nuclear Society Annual Meeting, Boston MA, 2007.
45. J. Penisten (maiden name) and R.F. Weiner. *Improved resuspension dose model for RADTRAN transportation risk-assessment code*. American Nuclear Society Winter Meeting, Washington DC, 2005.
46. M.L. Dennis, J. Penisten (maiden name), and R.F. Weiner. *Implementing a Monte Carlo sampling interface for RADTRAN*. American Nuclear Society Winter Meeting, Washington DC, 2005.
47. R.F. Weiner, J. Penisten (maiden name), and K.J. Kearfott. *Atmospheric dispersion model for RADTRAN*. Institute for Nuclear Materials Management 46<sup>th</sup> Annual Meeting, Phoenix AZ, 2005.
48. J. Penisten (maiden name), R.F. Weiner, and S. Hamp. *An economic model of a radioactive materials transportation accident for the RADTRAN risk assessment code*. Waste Management Meeting, Tucson AZ, 2005.
49. J. Penisten (maiden name) and S.A. Anderson. *A normalized pin power distribution for Westinghouse PWR cores*. American Nuclear Society Student Conference, Madison WI, 2004.

#### INVITED SEMINARS & OTHER SPECIAL LECTURES

1. *NSUF beam line experiment on advanced ferritic/martensitic and ODS alloys*. Nuclear Science User Facilities (NSUF) Annual Users Meeting, Idaho Falls ID, scheduled June 2016.
2. *Irradiation dose rate and particle type effects on strengthening of an oxide dispersion strengthened alloy*. Mechanical Engineering Department, Texas A&M University, College Station TX, February 2016.
3. *TEM in situ mechanical testing of irradiated oxide dispersion strengthened steel*. Mechanical Engineering & Materials Science Department, University of Cincinnati, Cincinnati OH, February 2016.
4. *Influence of irradiating particle type on hardening mechanisms in Fe-9Cr ODS alloy*. Department of Nuclear Engineering, North Carolina State University, Raleigh NC, January 2016.
5. *Irradiation evolution of strengthening mechanisms in oxide dispersion strengthened alloys*. School of Nuclear Engineering, Purdue University, West Lafayette IN, December 2015.
6. *Irradiation hardening characteristics of oxide dispersion strengthened alloys*. Mechanical, Industrial, & Manufacturing Engineering Department, Oregon State University, Corvallis OR, October 2015.
7. *Comparison of proton and neutron irradiation effects in Fe-9Cr ODS alloy*. Annual Nuclear Science User Facilities (NSUF) Industry Advisory Committee Meeting, Charlotte NC, July 2015.
8. *Role of solid solution strengthening in irradiated F/M and ODS alloys*. Nuclear Science User Facilities (NSUF) Annual Users Meeting, Idaho Falls ID, June 2015.
9. *Hardening mechanisms in neutron- and ion-irradiated Fe-9Cr ODS alloy*. Mechanical & Aerospace Engineering Department, University of California – Irvine, Irvine CA, October 2014.
10. *Materials challenges in nuclear energy systems*. MSE 497/597, Energy Materials, Materials Science & Engineering Department, Boise State University, Boise ID, September 2014.

11. *Microstructure-mechanical property relationships in advanced materials for nuclear energy systems*. Studiecentrum voor Kernenergie - Centre d'Étude de l'énergie Nucléaire (SCK-CEN, Belgian nuclear research center), Mol, Belgium, June 2014.
12. *Microstructure and mechanical property correlations in F/M and ODS steels*. Commissariat à l'énergie atomique et aux énergies alternatives (CEA, French Atomic Energy and Alternative Energies Commission), Saclay, France, June 2014.
13. *Understanding radiation-induced segregation in ferritic/martensitic steels over multiple dose scales*. Nuclear Engineering Program, University of Florida, Gainesville FL, November 2013.
14. *Radiation-induced segregation mechanisms in ferritic-martensitic alloys*. Materials Science & Engineering Department, Boise State University, Boise ID, September 2012.
15. *Radiation-induced segregation of T91*. Shared Research Equipment (ShaRE) User Facility Peer Review Meeting, Oak Ridge National Laboratory, Oak Ridge TN, 2009.

#### **NON-TECHNICAL INVITED SEMINARS & LECTURES**

1. *Early career research funding round table discussion*. Research Computing Program, Boise State University, Boise ID, March 2016.
2. *Professional development event: graduate school and industry preparedness (panel)*. Materials Science & Engineering Club, Boise State University, Boise ID, October 2015.
3. *Diversity in nuclear engineering (panel)*. American Nuclear Society Student Conference, College Station TX, April 2015.
4. *Nuclear engineering graduate school informational (panel)*. American Nuclear Society Student Conference, College Station TX, April 2015.
5. *Graduate school guidance*. MSE 601, Graduate Student Orientation Course, Materials Science & Engineering Department, Boise State University, Boise ID, December 2014.
6. *Graduate school informational (panel)*. Idaho Conference on Undergraduate Research, Boise State University, Boise ID, July 2014.
7. *First-year and transfer student bridge day (panel)*. Louis Stokes Alliance for Minority Participation (LSAMP) Program, Boise State University, Boise ID, July 2014.
8. *Faculty career informational (panel)*. GCOLL 511, Teaching in Higher Education, College of Graduate Studies, Boise State University, Boise ID, April 2014.
9. *Perspective on a career in academia (panel)*. ENGR 397, Perspectives on STEM Careers, College of Engineering, Boise State University, Boise ID, April 2014.
10. *Graduate school survival guide*. MSE 601, Graduate Student Orientation Course, Materials Science & Engineering Department, Boise State University, Boise ID, November 2013.
11. *Navigating STEM curricula as a minority student (panel)*. Louis Stokes Alliance for Minority Participation (LSAMP) Program, Boise State University, Boise ID, August 2013.

12. *A recent graduate's perspective on graduate school*. MSE 601, Graduate Student Orientation Course, Materials Science & Engineering Department, Boise State University, Boise ID, March 2013.
13. *Interview skills (panel)*. Society of Women Engineers Student Chapter, Boise State University, Boise ID, March 2013.
14. *The aging-changing nuclear workforce (panel)*. American Nuclear Society Annual Meeting, Boston MA, June 2007.

## RESEARCH ADVISORSHIP

### Graduate Students

1. Swenson, Matthew J., Ph.D. expected 2017 – *Innovations in Fuel Cycle Research Award, 2014*
2. Lepule, Masego, M.Engr. expected 2016 – *Fulbright Fellowship, 2014-16*
3. Smith, Kassiopeia, Ph.D. expected 2018
4. Yano, Kayla H., Ph.D. expected 2019

### Undergraduate Students and Other Advisees

1. Aguilar, Anaysa – Louis Stokes Alliance for Minority Participation (LSAMP) Program
2. Buss, Tasha – now at Micron
3. Byerly, Tegan – NSF Research Experience for Teachers Program
4. Da Silva, Douglas – Brazil Scientific Mobility Program
5. Gutierrez, Omar
6. Kalpakjian, Brett – now at Georgia Tech
7. Mayer, Kenneth
8. McDonald, Joshua
9. Ostrem, Kyle
10. Runyan, Cassidy – Boise State University Student Research Initiative Fellowship
11. Statkus, Thomas
12. Warren, Patrick – now at Micron

### Previous Students

1. Dolph, Corey K., M.Sc. 2015 – now at Micron  
Thesis: *Determination of plastic deformation and effective strain hardening coefficient for irradiated 9wt% Cr ODS alloy by nano-indentation and TEM*

## TEACHING

### Radiation Materials Science (MSE 497/597), 1 semester

3 credits, Graduate, Boise State University

Irradiation-induced point defect production in materials, including energy-transfer cross-sections, electronic and nuclear stopping, and displacement theory; kinetics of point defect diffusion and irradiation-enhanced diffusion; microstructure effects of irradiation damage; influence of point defects on materials properties.

### Mechanical Behavior of Materials I (MSE 512), 1 semester

3 credits, Graduate, Boise State University

Study of deformation and fracture in engineering materials, including elastic and plastic deformations; dislocation theory; alloy hardening and creep deformation; fracture mechanisms; linear elastic fracture mechanics; toughening of metals, ceramics, and composites; environmentally assisted failure.

**Mechanical Behavior of Materials** (MSE 312), 1 semester  
3 credits, Undergraduate, Boise State University

Elastic and plastic deformation and fracture in engineering materials, including dislocation theory, alloy hardening and creep deformation, fracture mechanisms, fracture mechanics, toughening of metals, ceramics, and composites, environmentally assisted failure.

**Point Defects** (MSE 497/527), 1 semester  
3 credits, Undergraduate/Graduate, Boise State University

Point defects in materials, particularly focused on defect chemistry, notation, ionic/electronic disorder, mass/charge balance, and the influence of point defects on materials properties.

**Engineering Statics** (ENGR 210), 2 semesters  
3 credits, Undergraduate, Boise State University

Force and moment equilibria applied to engineering systems including structures and machines. Two and three dimensional applications of scalars and vectors, free body diagrams, and methods and procedures of engineering analysis.

Teaching Assistantships and Grader Positions (all at University of Michigan):

**Transportation of Radioactive Waste** (NERS 590), 2005  
**Radiation Effects in Nuclear Materials** (NERS 521), 2008-09  
**Introduction to Statics and Mechanics** (MECHENG 211), 2004  
**Principles of Engineering Materials** (MATSCIE 250), 2003 & 2005  
**Introduction to Engineering** (ENGR 100), 2002 & 2003

## CONSULTING

1. **Welding metallurgy continuing education workshop** for professional engineer (PE) license requirements, POWER Engineers, Inc., Meridian ID, 2016
2. **Expert testimony** for the defense in Darigold vs. SPX, et al., on plastic deformation and failure in stainless steel butter pump and bearings, Boise ID, 2013-14

## AWARDS

2015-16 Boise State Teaching Scholars  
2014 Boise State Athletic Department Outstanding Faculty Recognition (Boise State)  
2013 Center for Teaching and Learning Travel Grant (Boise State)  
2011 Microstructural Processes in Irradiated Materials Symposium Student Oral Presentation  
Honorable Mention (TMS Annual Meeting)  
2011 Rackham Graduate School Travel Grant (UMich)  
2010 Innovations in Fuel Cycle Research Award  
2009 Rackham Graduate School Travel Grant (UMich)  
2007 Roy G. Post Foundation Scholarship  
2007 Professional Women in the American Nuclear Society Travel Scholarship  
2006 North American Young Generation in Nuclear Excellence Award  
2005 US DOE Office of Civilian Radioactive Waste Management Graduate Fellowship  
2005 John D. Randall Memorial Scholarship, American Nuclear Society  
2005 Mildred & Steele Bailey Prize (UMich College of Engineering)  
2005 Graduate Distinguished Leadership Award (UMich College of Engineering)  
2005 Samuel Glasstone Award (American Nuclear Society award for student chapters; UMich chapter received award during my tenure as chapter President)  
2004 Rhodes Scholarship Finalist

2004 National Academy for Nuclear Training Undergraduate Scholarship  
 2004 Tau Beta Pi  
 2004 Epeians Engineering Honorary  
 2004 Class of 1948E Engineering Merit Scholarship (UMich)  
 2003 Undergraduate Distinguished Leadership Award (UMich College of Engineering)  
 2003 James B. Angell Scholar (UMich)  
 2003 Marian Sarah Parker Scholar (UMich)  
 2003 Alpha Nu Sigma Nuclear Engineering Honorary  
 2002-04 US DOE Nuclear Engineering & Health Physics Undergraduate Scholarship  
 2002 National Academy for Nuclear Training Undergraduate Scholarship  
 2002 American Nuclear Society Undergraduate Scholarship  
 2002 Chihiro Kikuchi Memorial Scholarship (UMich Nuclear Engineering Department)  
 2002 William J. Branstrom Freshman Prize (UMich)  
 2002 George M. Landes Prize for Technical Writing (UMich College of Engineering)  
 2001-04 Robert C. Byrd Scholarship  
 2001-03 Class of 1952E Engineering Merit Scholarship (UMich)  
 2001-04 Sidney & Irene Shipman Scholarship (UMich)

## ORGANIZED & CHAIRED SYMPOSIA & SESSIONS

September 2016 Symposium Co-Organizer. *Materials, processing, and characterization techniques for future nuclear technologies*. European Materials Research Society Fall 2016 Meeting, Warsaw, Poland.

May 2015 Workshop Organizer and Session Chair, *Materials, Modeling, Simulation, and Visualization Workshop*. Center for Advanced Energy Studies and Boise State University, McCall ID.

March 2015 Session Chair, *Ferritic/Martensitic Alloys in Microstructural Processes in Irradiated Materials Symposium*. The Minerals, Metals & Materials Society Annual Meeting, Orlando FL.

September 2014 Session Chair, *Symposium G: Materials, processing, and characterization techniques for future nuclear technologies*. European Materials Research Society Fall 2014 Meeting, Warsaw, Poland.

September 2014 Workshop Organizer and Session Chair, *Energy Storage and Ion Conducting Materials and Modeling Workshop*. Center for Advanced Energy Studies and Boise State University, Boise ID.

August 2014 Session Chair, *Materials for Nuclear Applications Symposium*. XXIII International Materials Research Congress (IMRC 2014), Cancún, Mexico.

February 2014 Session Chair, *Radiation Effects in Oxide Ceramics and Novel LWR Fuels – Experimental Characterization of Radiation Effects in Oxide Ceramics*. The Minerals, Metals & Materials Society Annual Meeting, San Diego CA.

April 2010 Organizer, *Nuclear Energy Public Forum*. American Nuclear Society Student Conference, Ann Arbor MI.

November 2008 Organizer, *Student Poster Session*. Nuclear Engineering & Radiological Sciences Department 50<sup>th</sup> Anniversary, University of Michigan, Ann Arbor MI.

- November 2007 Workshop Organizer and Session Chair, *Employee Retention in the Nuclear Industry*. American Nuclear Society Young Professionals Workshop embedded topical meeting at the American Nuclear Society Winter Meeting, Washington DC.
- July 2007 Organizer, Carolinas Regional Professional Development Conference. North American Young Generation in Nuclear, Charlotte NC.
- May 2007 Organizer and Session Chair, *Understanding the Role of Ethics in Nuclear*. North American Young Generation in Nuclear Annual Professional Development Workshop, Miami FL.
- October 2006 Organizer, *Training to Become a Public Advocate for Nuclear Energy*. North American Young Generation in Nuclear, Charlotte NC.
- March 2005 Organizer, *Student Research from the Nuclear Engineering & Radiological Sciences Department at the University of Michigan*. American Nuclear Society Michigan Section Meeting, Ann Arbor MI.

## PROFESSIONAL SERVICE

### Manuscript Reviewing

Computational Materials Science  
Journal of Applied Physics  
Journal of Materials Research  
Journal of Nuclear Materials  
Materials Research Bulletin  
Nuclear Technology

### Conference Proceedings Reviewing

American Nuclear Society / Transactions of the American Nuclear Society  
International Congress on Advances in Nuclear Power Plants (ICAPP)  
Nuclear Fuels and Structural Materials (NFSM)

### Proposal Reviewing

National Science Foundation (NSF) – DMREF  
US DOE BES Energy Frontier Research Centers  
US DOE Nuclear Energy University Programs  
US DOE Nuclear Science User Facilities  
Czech Science Foundation

- 2016-17 Chairperson, Materials Science & Technology Division, American Nuclear Society  
2015-16 Vice Chairperson, Materials Science & Technology Division, American Nuclear Society  
2014-17 Materials Science & Technology Division Executive Committee, American Nuclear Society  
2013- User Group Member, Advanced Test Reactor National Scientific User Facility  
2013-14 User Group Member, Environmental Molecular Sciences Laboratory, PNNL  
2012-14 Nuclear Materials Committee, The Minerals, Metals & Materials Society  
2009-13 User Group Member, Shared Research Equipment User Facility (ShRE), ORNL

## UNIVERSITY SERVICE

- 2015-16 Undergraduate Advising (40 students), MSE Department  
2015 Louis Stokes Alliance for Minority Participation (LSAMP) Summer Research Opportunity Review Committee  
2014-15 Student Research Initiative Fellowship Review Committee  
2014 STEM Diversity Coordinator Selection Committee  
2013-14 College of Engineering representative at out-of-state student recruitment events

2013-14 Undergraduate Curriculum Committee, MSE Department  
2013 Teaching Assistant Committee, MSE Department  
2013 Advanced Math Working Group, College of Engineering  
2013 Mentor, Louis Stokes Alliance for Minority Participation (LSAMP) Program  
2013 Mentor, Society of Women Engineers

## PROFESSIONAL SOCIETY & COMMUNITY SERVICE

2015-18 Education Committee, The Minerals, Metals & Materials Society  
2015 Idaho Science and Aerospace Scholars Workshop  
2009-11 Graduate Student Advisory Board, UMich College of Engineering  
2007-10 Board of Governors, UMich College of Engineering Alumni Society  
2008-10 Vice Chair, Membership Committee, American Nuclear Society (Elected)  
2007-10 Membership Committee, American Nuclear Society  
2007-10 Development Committee, American Nuclear Society  
2007-08 Public Information Officer, North American Young Generation in Nuclear (Elected)  
2006-07 Secretary/Treasurer, Piedmont Carolina Section, American Nuclear Society (Elected)  
2006-07 Math Counts quiz bowl tutor  
2006-07 Chair, Junior Engineer Mentorship Program, Duke Energy  
2005-08 Student Sections Committee, American Nuclear Society  
2005 Treasurer, UMich Section, Tau Beta Pi (Elected)  
2004-05 President, UMich Student Section, American Nuclear Society (Elected)  
2004-05 Board Member, UMich Section, Alpha Nu Sigma (Elected)  
2004-05 Board Member, Epeians Engineering Honorary (Elected)  
2003-04 Undergraduate Student Advisory Board, UMich College of Engineering  
2003-04 Advisory Board, Dean's Mentoring Initiative, UMich College of Engineering  
2002-03 Secretary, UMich Student Section, American Nuclear Society (Elected)

## MEMBERSHIP

The Minerals, Metals & Materials Society  
American Nuclear Society  
American Ceramic Society  
American Society for Engineering Education  
Materials Research Society  
North American Young Generation in Nuclear  
Tau Beta Pi

## OTHER QUALIFICATIONS & WORKSHOPS ATTENDED

2015 Nuclear Energy Institute (NEI) Strategic Planning Group (**invited**)  
2015 Department of Energy Nuclear Innovation Workshop (**invited**)  
2015 Lawrence Epitaxy Symposium  
2014 French Section of the American Nuclear Society (SFANS) technical tour of the French nuclear facilities for U.S. professors (**invited**)  
2013 Process Oriented Guided Inquiry Learning (POGIL) Teaching Workshop  
2008 Advanced Test Reactor National Scientific User Facility Inaugural Summer School  
2007 National Instruments® LabVIEW Campus Workshop  
2006 F.E. (Fundamentals of Engineering) licensure