Kevin G. Field, Ph.D.

Contact Information

Associate Professor
Nuclear Engineering and Radiological Sciences
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Kevin-Field
K.G. Field

Qualifications

Accomplished principal investigator with extensive experience in conducting and managing research and development (R&D) projects on materials for nuclear systems.

Education

University of Wisconsin - Madison, Madison, WI 2007 to 2012
Ph.D. (2012), M.S. (2009), Materials Science

Michigan Technological University, Houghton, MI 2003 to 2007
B.S. (2007), Materials Science and Engineering
- Honors: *Magna cum laude*

Professional Experience

Associate Professor 2019 to present
Nuclear Engineering & Radiological Sciences, University of Michigan

Staff Scientist 2015 to 2019
Weinberg Fellow 2013 to 2015
Materials Science and Technology Division, Oak Ridge National Laboratory

Research Assistant 2007 to 2012
Materials Science Program, University of Wisconsin - Madison

Awards, Honors, and Recognition

- Early Career Award, Department of Energy - Fusion Energy Sciences, 2020
- Outstanding Reviewer Award, Materialia - Acta Materialia, Inc, 2019
- UT-Battelle Award for Early-Career Researcher in Science and Technology, Oak Ridge National Laboratory, 2018
- Significant Event Award (SEA), Oak Ridge National Laboratory, 2017 & 2018
- 2016 Young Researcher Award, NuMat Conference, Montpellier, France, 2016
- 2015 American Nuclear Society (ANS) Materials Science and Technology Division Significant Contribution Award, ANS Summer Meeting, New Orleans, LA, 2016
- 2014 American Nuclear Society (ANS) Materials Science and Technology Division Significant Contribution Award, ANS Summer Meeting, New Orleans, LA, 2016
- Department of Energy Nuclear Energy Fuel Cycle R&D Excellence Award, American Nuclear Society Winter Meeting, Washington D.C., 2015
- Best Distinguished Fellowship Poster, Office of the Laboratory Director's 2015 LDRD Poster Session, Oak Ridge National Laboratory, Oak Ridge, TN, 2015
- Certificate of Appreciation presented to Advanced Steel Cladding Team, by U.S. Department of Energy at the Fuel Cycle R&D Meeting, Washington D.C., 2014
- Alvin M. Weinberg Fellowship, Oak Ridge National Laboratory, 2013 - 2015
- Fuel Cycle R&D Student Poster Award, Fuel Cycle R&D Meeting, Washington D.C., 2010
- Raymond G and Anne W. Herb Wisconsin Distinguished Graduate Fellow in Materials Science, University of Wisconsin - Madison, 2007 - 2008
- Undergraduate Scholarship Awards from the American Foundry Society (AFS), Foundry Educational Foundation (FEF), ASM Detroit & Toledo Ohio Chapter, 2007 - 2008
- McArthur Research Internship Grant, Michigan Technological University, 2007
- AFS Detroit Windsor Scholarship, Foundry Education Foundation, 2006
- FEMET Scholarship Award, Association for Iron & Steel Technology (AIST), 2005 - 2006

OVERVIEW OF RESEARCH PUBLICATIONS WHILE AT U. OF MICHIGAN

CY:	2020
Refereed Journals	5*
Refereed Conference Proceedings	0
Published Conference Abstracts	0
National Laboratory Reports	1
Published Software	0
Books & Chapters	1
Total	7
Total w/ scholarly advising	1

*A portion of these publications could contain content generated while affiliated with ORNL

OVERVIEW OF RESEARCH PUBLICATIONS WHILE AT ORNL

CY:	2013	2014	2015	2016	2017	2018	2019
Refereed Journals	1	4	11	4	9	8	10
Refereed Conference Proceedings	1	1	1	2	3	0	0
Published Conference Abstracts	1	4	3	6	1	4	0
National Laboratory Reports	2	8	14	10	10	5	3
Published Software	2	0	0	0	0	1	0
Books & Chapters	0	0	0	0	0	0	0
Total	7	17	29	22	23	18	13
Total w/ scholarly advising	0	0	1	7	9	7	3

REFEREED JOURNAL PUBLICATIONS

[1] W. Zhong, N. Sridharan, D. Isheim, **K.G. Field**, Y. Yang, K.A. Terrani, L. Tan, Microstructures and mechanical properties of a modified 9Cr ferritic-martensitic steel in the as-built condition after additive manufacturing, Accepted in *Journal of Nuclear Materials*, 2020, ISSN 0022-3115.

[2] P. Xiu, H. Bei, Y. Zhang, L. Wang, **K.G. Field**, STEM characterization of dislocation loops of irradiated FCC alloys, Accepted in *Journal of Nuclear Materials*, 2020, ISSN 0022-3115.

[3] M. Song, **K.G. Field**, R.M. Cox, G.S. Was, Microstructural characterization of cold-worked 316 stainless steel flux thimble tubes irradiated up to 100 dpa in a commercial pressurized water reactor, *Journal of Nuclear Materials*, 2020, Volume 541, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2020.152400

[4] S. Raiman, **K.G. Field**, R. Rebak, Y. Yamamoto, K.A. Terrani, Hydrothermal corrosion of 2nd generation FeCrAl alloys for accident tolerant fuel classing, *Journal of Nuclear Materials*, Volume 536, 2020, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2020.152221.

[5] **K.G. Field**, B.P. Eftink, C.M. Parish, S.A. Maloy, High Efficiency Three-Dimensional Visualization of Complex Microstructures via Multi-Dimensional STEM Acquisition and Reconstruction, *Microscopy & Microanalysis*, 2020, Volume 26, Issue 2, Pages 240-246, ISSN 1431-9276, https://doi.org/10.1017/S1431927620000173.

[6] A. Lumsdaine, R. Maingi, **K.G. Field**, S. Gourlay, D. Humphreys, Y. Katoh, C. Kessel, X. Wang, Perspectives on the FESAC Transformative Enabling Capabilities: Priorities, Plans, and Status, *Fusion Engineering & Design*, 2020, Volume 155, 111529, ISSN 0920-3796, https://doi.org/10.1016/j.fusengdes.2020.111529.

[7] C. Zheng, E.R. Reese, **K.G. Field**, T. Liu, E.A. Marquis, S.A. Maloy, D. Kaoumi, Microstructure response of ferritic/martensitic steel HT9 after neutron irradiation: Effect of temperature, *Journal of Nuclear Materials*, 2019, Volume 528, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.151845.

[8] M.A. Auger, D.T. Hoelzer, **K.G. Field**, M.P. Moody, Nanoscale analysis of ion irradiated ODS 14YWT ferritic alloy, *Journal of Nuclear Materials*, 2019, Volume 528, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.151852.

[9] S. Taller, Z. Jiao, **K.G. Field**, G.S. Was, Emulation of fast reactor irradiated T91 using dual ion beam irradiation, *Journal of Nuclear Materials*, Volume 527, 2019 , 151831, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.151831.

[10] D. Zhang, S.A. Briggs, P.D. Edmondson, M.N. Gussev, R.H. Howard, **K.G. Field**, Influence of welding and neutron irradiation on dislocation loop formation and α' precipitation in a FeCrAl alloy, *Journal of Nuclear Materials*, Volume 527, 2019, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.151784.

[11] C. Zheng, E.R. Reese, **K.G. Field**, E. Marquis, S.A. Maloy, D. Kaoumi, Microstructure response of ferritic/martensitic steel HT9 after neutron irradiation, *Journal of Nuclear Materials*, Volume 523, 2019, Pages 421-433, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.06.019.

[12] N. Sridharan and **K.G. Field**, A road map for the advanced manufacturing of ferritic martensitic steels, *Fusion Science and Technology*, Volume 75, 2019, Pages 264-274, ISSN 1536-1055, https://doi.org/10.1080/15361055.2019.1577124.

[13] N. Sridharan, M.N. Gussev, **K.G. Field**, Performance of a ferritic/martensitic steel for nuclear reactor applications fabricated using additive manufacturing, *Journal of Nuclear Materials*, Volume 521, 2019, Pages 45-55, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.04.020.

[14] **K.G. Field**, J.L. McDuffee, J.W. Geringer, C.M. Petrie, Y. Katoh, Evaluation of the continuous dilatometer method of silicon carbide thermometry for passive irradiation temperature determination, *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, Volume 445, 2019, Pages 46-56, ISSN 0168-583X, https://doi.org/10.1016/j.nimb.2019.02.022.

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[19] D. Zhang, S.A. Briggs, **K.G. Field**, Role of refractory inclusions in the radiation-induced microstructure of APMT, *Journal of Nuclear Materials*, Volume 505, July 2018, Pages 165-173, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2018.04.017.

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Refereed Conference Publications

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[55] M.N. Gussev, **K.G. Field**, Y. Yamamoto, Mechanical behavior and structure of advanced Fe-Cr-Al alloy weldments, *18th International Conference on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors*, Portland, OR, USA, August 13-17, 2017.

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[61] **K.G. Field**, C.J. Wetteland, G. Cao, B.R. Maier, C. Dickerson, T.J. Gerczak, C.R. Field, K. Kriewaldt, K. Sridharan, T.R. Allen, University of Wisconsin Ion Beam Laboratory: A facility for irradiated materials and ion beam analysis. In: *22nd International Conference on Application of Accelerators in Research and Industry*, Fort Worth TX, USA, August 5-10, 2012, http://dx.doi.org/10.1063/1.4802311.

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[131] T. Rosseel and **K.G. Field**, Revised statement of work: Acquisition of Zion concrete cores (Phase 1), FY-15 DOE-NE LWRS Report: *ORNL/LTR-2014/479*, January 2015.

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INVITED TECHNICAL PRESENTATIONS

[1] N. Sridharan, T.M.K. Green, P. Xiu, S. Taller, X. Chen, L. Tan, Y. Yang, **K.G. Field**, Development of novel high throughput alloy design strategies for steels in extreme environments via additive manufacturing, Invited presentation at the *University of Michigan Materials Science & Engineering Department Seminar*, performed remotely, October 2020

[2] **K.G. Field**, Rapid nuclear materials discovery through innovative approaches to characterization, Invited presentation at the *University of California - Berkeley Nuclear Engineering Department Seminar*, performed remotely, October 2020.

[3] **K.G. Field**, M. Shen, C.P. Massey, K.C. Littrell, D.D. Morgan, Rapid characterization methods for accelerated innovation for nuclear fuel cladding, Invited presentation for *Microscopy & Microanalysis 2020*, Digital Presentation, August 2020.

[4] **K.G. Field**, M. Shen, D.D. Morgan, Towards a non-biased approach for dislocation loop quantification in irradiated BCC alloys, Invited presentation for *E-MRS 2020 Spring Meeting*, Canceled due to COVID-19 pandemic.

[5] **K.G. Field**, M.N. Gussev, X. Chen, C.P. Massey, D. Zhang, S.A. Briggs, J.P. Wharry, K.A. Terrani, Separate effects to integral effects - all things radiation effects in FeCrAl, Invited presentation at *TMS 2020*, San Deigo, CA USA, February 2020.

[6] **K.G. Field**, Structure-property relationships for 12-18% Cr ODS and 9% Cr RAFM steels irradiated to high dose (>40 dpa) at fusion relevant temperatures, Invited presentation at the *International Conference on Fusion Reactor Materials*, La Jolla, CA, October 2019.

[7] **K.G. Field**, M. Shen, G. Li, D. Wu, Y. Yaguchi, J.C. Haley, D.D. Morgan, Machine learning for rapid defect quantification in static and dynamic electron microscopy experiments, Invited presentation at the *Materials in Nuclear Energy Systems Conference*, Baltimore, MD, October 2019.

[8] **K.G. Field**, M.N. Gussev, R.H. Howard, X. Chen, Effective use of small irradiation volumes, Invited presentation at the *Workshop for the Fusion Prototypic Neutron Source (FPNS)*, Gaithersburg, MD, August 2018.

[9] **K.G. Field**, A perspective on accelerated development for materials and fuels for nuclear reactors, Invited stage setter presentation at the *Technologies to Reactors: Enabling accelerated deployment of nuclear energy systems workshop*, Oak Ridge, TN, July 2018.

[10] **K.G. Field**, Innovations for the 21st Century Nuclear Industry at ORNL, Invited plenary presentation at the *Conference of the International Cooperative Group on Environmentally-Assisted Cracking*, Knoxville, TN, April 2018.

[11] **K.G. Field**, The 6 year time line for IronClad deployment, Invited lightening talk for Oak Ridge National Laboratory's Nuclear Science and Engineering Directorate's Advisory Committee, Oak Ridge, TN 2018.

[12] **K.G. Field**, Designing Materials for Enhanced Safety in LWRs, Invited presentation at the *University of Florida Department Seminar*, Gainesville, FL, April 2018.

[13] **K.G. Field**, Image formation and quantification of dislocation loops in irradiated materials using STEM, Invited presentation at *Microscopy of Irradiated Damage*, Oxford, UK, March 2018.

[14] **K.G. Field**, K.C. Littrell, S.A. Briggs, Ex-situ and in-situ determination of α' phase formation/dissolution in high-Cr ferritic alloys using small angle neutron scattering, Invited presentation at *TMS 2018*, Phoenix, AZ USA, March 2018.

[15] **K.G. Field**, J. Haley, S.A. Briggs, K. Sridharan, S. Lozano-Perez, S. Roberts, Dislocation loop dynamics in irradiated FeCrAl alloys, Invited presentation at *MS&T 2017*, Pittsburgh, PA USA, October 2017.

[16] **K.G. Field**, S.A. Briggs, J. Haley, M.N. Gussev, K.C. Littrell, P.D. Edmondson, Y. Yamamoto, X. Hu, R.H. Howard, Z. Jiao, G. Was, K. Sridharan, L.L. Snead, K.A. Terrani, Microstructures in irradiated and deformed FeCrAl alloys, Invited presentation at *TMS 2017*, San Diego, CA USA, March 2017.

[17] **K.G. Field**, Y. Yamamoto, S.A. Briggs, M. Gussev, K.A. Uncoil, B.A. Pint, R.B. Rebak, L.L. Snead, K.A. Terrani, Advancements in FeCrAl alloys for enhanced accident tolerant fuel cladding for light water reactors, Invited presentation at *ANS Summer Meeting 2016*, New Orleans, LA USA, June 2016.

[18] **K.G. Field**, Designing advanced FeCrAl alloys for accident tolerant fuel cladding through accelerated irradiation testing, Invited presentation at *ANS Winter Meeting 2015*, Washington, DC USA, November 2015.

OVERVIEW OF GRANTS WHILE AT U. OF MICHIGAN

	2019	2020	-	-	-	-	**Total**
Awarded - $M(#)	0.20(2)	1.41(6)	-	-	-	-	1.61(8)
Not Awarded - $M(#)	2.25(3)	0.90(3)	-	-	-	-	3.15(6)
Facility Awarded - #	1	1	-	-	-	-	2
Facility Not Awarded - #	0	2	-	-	-	-	2

GRANTS WHILE AT U. OF MICHIGAN

Awaiting Decision

[1] Co-PI, "An open in-situ machine vision platform for electron microscopy", DOE Office of Basic Energy Sciences SBIR Phase I Proposal, 2020. Total: $200k, Field: $60k, February 1, 2021 to October 30, 2021.

[2] PI, "Catalyst for a nuclear maker space for assessment and education in additive manufacturing for the nuclear industry", NRC, *NRC 31310020K0001*, 2020. Total: $500k, April 1, 2021 to March 31, 2024.

Awarded

[3] PI, "Large format 3D printer and scanner for research and makerspace", FPtZ Grant - UM internal, 2020. Total: $50k. October 2020.

[4] Co-PI, "Advance castable nanostructured alloys for first-wall/blanket applications", ARPA-E, *DOE-FOA-0002288*, 2020. Total: $3300k, Field: $300k, October 1, 2020 to September 30, 2023.

[5] PI, "Precipitate stability and helium trapping in advanced steels", DOE, *DOE-FOA-0002173; PRE-0000021739*, 2020. Total: $750k, October 1, 2020 to September 30, 2025.

[6] PI, "Development of a High Throughput Nuclear Materials Synthesis Laboratory", DOE, *DOE-FOA-0002128: General Scientific Infrastructure Support*, Application ID: - GSI-20-21567. Submitted 2019. Equipment procurement estimated at $166.6k.

[7] PI, "Machine Learning for Identification of Multiple Defects in Microscopy Images", Idaho National Laboratory, INL Subcontract Solicitation, DE-AC07-05ID14517, $30k. FY20.

[8] PI, "Machine learning for automated defect analysis in irradiated austenitic steels", Electric Power Research Institute, *EPRI Subcontract Solicitation*, $111k. CY20.

[9] Co-PI, "Morphological Response of Spherical and Platelet MX-Type Precipitates to In-Situ Ion Irradiation in Novel Fe-Based Alloys", DOE, *NSUF-RTE*, Project Number - 20-4200, MIBL Facility Access, 2020.

[10] PI, “Radiation effects testing and characterization for advanced Fe-based alloys, ORNL Subcontract Solicitation 6400016348, Sub-contract Number 4000175183, $151.5k, FY20.

[11] Co-PI, “Program development collaborations with University of Michigan’, INL Subcontract Solicitation, DE-AC07-05ID14517, $48k, FY20.

[12] Co-PI, “Dose rate effects on irradiation-enhanced precipitation in FeCrAl alloys’, DOE, *NSUF-RTE*, Project Number - 2889, CAES Facility Access, 2019.

Not Awarded

[13] Co-PI, “Probing the role of α’ precipitation on the deformation mechanisms of neutron irradiated FeCrAl alloys’, DOE, *NSUF-RTE*, Project Number - 20-4187, ORNL Facility Access, 2020.

[14] Co-PI, “Microchemical evolution of irradiated wrought and additively manufactured HT9’, DOE, *NSUF-RTE*, Project Number - 20-4097, CAES Facility Access, 2020.

[15] Co-PI, "Infrastructure to support MSR research and development", DOE, *DOE-FOA-0002128; IRP Project 20-21651*, 2020. Total: $5M, Field: $82.7k, October 1, 2020 to September 30, 2023.

[16] Co-PI, "Corrosion and irradiation performance of nanostructured high creep strength alloys for molten chloride fast reactors", DOE, *DOE-FOA-0002128; NEUP Project 20-19317*, 2020. Total: $800k, Field: $320k, October 1, 2020 to September 30, 2023.

[17] Co-PI, “Rapid quantification of irradiation-induced microstructure by machine/deep learning”, DOE, *DE-FOA-0002128: NSUF-1.3: Nuclear Materials Discovery and Qualification*, 2020-2023. $500k, Pre-proposal submitted in 2020.

[18] PI, “Large-area metal additive for field fabrication of nuclear civil structures”, DOE, *DE-FOA-0002128: NEET-1: Advanced Methods for Manufacturing*, 2020-2023. $1M, Pre-proposal submitted in 2019.

[19] PI, “Rapid evaluation of defect sinks in additive manufactured advanced Fe-based alloys”, DOE, *DE-FOA-0002128: NSUF-1.2: Irradiation Testing of Materials Produced by Innovative Manufacturing Techniques*, 2020-2023. $500k, Pre-proposal submitted in 2019.

[20] Co-PI, “Advanced surface engineering of AM parts for enhanced corrosion”, DOE, *DE-FOA-0002128: NEET-1: Advanced Methods for Manufacturing*, 2020-2023. $750k, Pre-proposal submitted in 2019.

OVERVIEW OF GRANTS WHILE AT ORNL

	2013	2014	2015	2016	2017	2018	**Total**
Awarded - $M(#)	0.18(1)	1(1)	0(0)	0.28(1)	1.5(1)	2.58(2)	5.26(6)
Not Awarded - $M(#)	0(0)	1.6(2)	1.8(2)	1(1)	1.9(2)	5.26(3)	13.96(10)
Facility Awarded - #	1	0	5	1	2	4	13
Facility Not Awarded - #	0	0	2	2	3	0	7

GRANTS WHILE AT ORNL

Awarded

[1] Co-PI, “In-situ TEM deformation of neutron irradiated FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 1566, CAES Facility Access, 2018.

[2] PI, "Rapid simulation of irradiation damage in PWR Internals", DOE, *DOE-FOA-00001772: NSUF-2; NSUF Project 18-15478*, 2018. Facility access estimated at $323k.

[3] Co-PI, “Effects of welding on radiation-enhanced precipitation in FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 1441, CAES Facility Access, 2018.

[4] Co-PI, “Evaluating void swelling and microstructure evolution of additively manufactured HT9”, DOE, *NSUF-RTE*, Project Number - 1491, MIBL Facility Access, 2018.

[5] Co-PI, "Microstructure-based benchmarking for nano/microscale testing of irradiated steels", DOE, *DOE-FOA-00001772: FC 2.1 Benchmarking Microscale Mechanical Property Measurements; NEUP Project 18-15148*, 2018. $800k, October 1, 2018 to September 30, 2021.

[6] Co-PI, "Application of Machine Learning for Performance Prediction of an Advanced Manufactured Nuclear Component", ORNL, *ORNL LDRD Initiative*, 2018, $1.76M, April 2018 to January 2019.

[7] Co-PI, “Rapid Simulation of Irradiation Damage in PWR Internals”, EPRI - Primary Systems Corrosion Research, 2017, $1.5M, May 2017 to May 2020.

[8] Co-PI, “Study of nanocluster stability in neutron- and ion-irradiated ODS FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 954, Sandia/LAMDA Facility Access, 2017.

[9] Co-PI, “Radiation induced segregation and phase separation in neutron irradiated FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 908, LAMDA Facility Access, 2017.

[10] Co-PI, “Parametric study of factors affecting precipitation in model FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 687, CAES Facility Access, 2016.

[11] Co-PI, “Enhanced Micro-analytical Capabilities of Irradiated Materials”, DOE, *DE-FOA-0001130: General Scientific Infrastructure Support*, 2016. $281k, 2016.

[12] Co-PI, “Correlative Atom Probe and Electron Microscopy Study of Radiation Induced Segregation at Low and High Angle Grain Boundaries in Steels”, DOE, *DE-FOA-0001281: NEET-NSUF-2*, 2015. Access request to Nuclear Science User Facilities, Awarded for FY17-19.

[13] PI, “Characterization of Precipitation Behavior in HFIR Irradiated FeCrAl Alloys for Nuclear Applications”, DOE, *HFIR*, Project Number - IPTS-13692, Accepted 2015, Programmatic proposal for GP-SANS (neutron scattering) facility access, 2015 to 2017.

[14] Co-PI, “Mechanistic determination of dislocation loop formation in irradiated FeCrAl alloys through systematic in situ experimentation”, *ANL IVEM Tandem*, IVEM user access, 2015.

[15] Co-PI, “Radiation induced segregation and phase separation in neutron irradiated FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 546, LAMDA Facility Access, 2015.

[16] Co-PI, “Irradiation effects on structure and properties of LWR concrete”, DOE, *NSUF-RTE*, Project Number - 556, Ion Beam Facility Access, 2015.

[17] PI, “Radiation Tolerance of Controlled Fusion Welds in High Temperature Oxidation Resistant FeCrAl Alloys for Enhanced Accident Tolerant Fuel Cladding Applications”, DOE, *DE-FOA-0000998: NEET-3 Reactor Materials*, 2014. $1M, October 1, 2014 to September 30, 2017.

[18] PI, “Mechanical Testing and Characterization of Irradiated Concrete Structures for Light Water Reactor Life Extension Analysis”, *ORNL-LDRD*, Project Number - 7088, $180K, July 15, 2013 to July 15, 2015.

[19] PI, “Examining the variations in microchemistry of irradiated ferritic-martensitic steels for the next generation of nuclear power plants”, NSF, Project Number - 1107424, $5,700, June 1, 2011 to August 31, 2011.

[20] PI, “Grain boundary microchemistry of ion irradiated ferritic/martensitic steels as determined by advanced microscopy techniques ”, DOE, *NSUF-RTE*, Project Number - 313, CAES Facility Access, 2011.

Not Awarded

[21] Co-PI, "Accelerated experiments for mechanistic creep predictions of FeCrAl steels for reactor cladding applications", DOE, *DOE-FOA-0001913: FY19 Consolidated Innovative Nuclear Research*, 2019. $800k, FY20 to FY22.

[22] Co-PI, "Irradiation testing of materials produced by innovative manufacturing techniques", DOE, *DOE-FOA-0001913: FY19 Consolidated Innovative Nuclear Research*, 2019. Irradiation and Testing Access and $150k R&D support, , FY20 to FY22.

[23] Co-PI, "Accelerated and improved materials testing through integrated and multiphysics simulations", ORNL, *ORNL-LDRD*, Project Number - 9510, $920k, Submitted for FY19 to FY21.

[24] PI, "Additive Manufactured Nanostructured FM Steels for Advancement of Nuclear Reactor Development", DOE, *DOE-FOA-00001772: NEET-11*, 2018, $1M, FY19 to FY21.

[25] PI, "Development of a Monolithic Sodium Fast Micro Reactor (SFMR) for Distributed Generation using Advanced Modeling and Manufacturing Techniques", DOE ARPA-E, *DOE-FOA-0001798: MEITNER*, 2018, $3.35M, FY19 to FY21.

[26] PI, "Rapid simulation of irradiation damage in PWR internals", DOE, *NSUF-RTE*, Project Number - 1067, LAMDA Facility Access, 2017.

[27] Co-PI, "High fidelity ion beam simulation of high dose neutron irradaition", DOE, *DE-FOA-0001515: NEET-NSUF-2*, 2016. Full proposal submitted for 2017.

[28] Co-PI, "Application of additive manufactured specimens in materials test reactors for rapid alloy development efforts", DOE, *DE-FOA-0001515: NEET-NSUF-2*, 2016. Pre-proposal submitted for 2017.

[29] Co-PI, "Plastic deformation mechanisms and deformation localization in neutron-irradiated cast austenitic steels", DOE, *DE-FOA-0001515: NEET-NSUF-1.1b*, 2016. Pre-proposal submitted for 2017.

[30] Co-PI, "Development of the Irradiation and Isotopes Center of Excellence", ORNL, *ORNL-LDRD*, Project Number - 8266, $1M, Submitted for FY17 to FY19.

[31] Co-PI, "Accelerated Novel Material Development Through Advanced Additive Manufacturing Technologies For Nuclear Applications", ORNL, *ORNL-LDRD*, Project Number - 8798, $900k, Submitted for FY18 to FY20.

[32] PI, "Radiation-induced microstructural and micro chemical effects in FeCrAl alloys", DOE, *DE-FOA-0001281: NEET-NSUF-2*, 2015. Access request to Nuclear Science User Facilities, Submitted for FY17 to FY19.

[33] Co-PI, "Effect of Cr and Mo on thermal/radiation-induced segregation and precipitation of Fe-Ni-Si alloys", DOE, *DE-FOA-0001281: NEET-NSUF 1.1A*, 2015. Access request to Nuclear Science User Facilities, Submitted for FY17 to FY19.

[34] PI, "Novel M3-characterization concept for irradiated materials: Multi-spectral, Multi-field, Multi-scale", DOE, *DE-FOA-0001281: NEET-3: Reactor Materials*, 2015. $1M, Pre-proposal submitted for 2016.

[35] PI, "Determination of mechanical properties in high dose neutron irradiated PM2000", DOE, *NSUF-RTE*, Project Number - 851, Hot Cell Facility Access, 2016.

[36] PI, "Radiation tolerance of a FeCrAl alloy neutron irradiated up to 65 dpa", DOE, *NSUF-RTE*, Project Number - 692, Hot Cell Facility Access, 2016.

[37] PI, "Elimination of Detrimental α' Precipitation in Irradiated *bcc* Fe-Cr Based Alloys For Nuclear Applications Through Solute Additions", DOE, *DE-FOA-0001129: NEET-3 Reactor Materials*, $1M, Pre-proposal submitted for 2015.

[38] Co-PI, "Pellet Cladding Interaction of ATF FeCrAl Clad Alloys", DOE, *DE-FOA-0001129: FC-2.1: Advanced Nuclear Fuel, Cladding, and Core Components*, Full proposal submitted in 2015. $800K, over 3 years.

[39] Co-PI, "Study of ultra-durable concrete subjected to combined exposures in used fuel structures", DOE, *DE-FOA-0000998: FC-4.1 Storage*, Project Number - RPA-14-6549, February 2014. $800K, over 3 years.

[40] Co-PI, "Advanced Joining Techniques for High Sink Strength Ferritic-Martensitic Steels", DOE, *DE-FOA-0000998: NEET-3 Reactor Materials*, 2014. $800K, over 2 years.

TEACHING EXPERIENCE

University of Michigan, Ann Arbor, MI

Course facilitator for NERS290: **Winter 2020**
"Special Topics for Nuclear Engineering and Radiological Sciences "
- Undergraduate survey course on NERS

Instructor for NERS499: "Special Projects" **Winter 2020**
- Senior undergraduate level project course (nanoindentation of irradiated alloys)

Group Mentor for NERS492: "NERS Design 2' **Winter 2020**
- Senior undergraduate level project course

Guest Lecturer for NERS211:
"Introduction to Nuclear Engineering & Radiological Sciences' **Winter 2020**
- Lecture: *"Materials for Nuclear Systems"*

Co-instructor for NERS521: "Radiation Materials Science I " **Fall 2019**
- Graduate level course of radiation effects (production, mobility, and clustering)

Instructor for NERS799: "Special Projects" **Fall 2019**
- Graduate level project course (literature review and manuscript draft)

University of Wisconsin - Madison, Madison, WI

Guest Lecturer for NE 424: "Nuclear Materials Laboratory" **Fall 2017**
- Lecture: *"Designing FeCrAl alloys for accident tolerant fuel cladding"*

Guest Lecturer for NE 541: "Radiation Damage in Metals" **Fall 2011**
- Lecture: *"Microstructure Fundamentals"*

Co-instructor for MSE 250: "Introduction to Modern Materials." **2010**
- Overview course on applications and design of modern materials for non-materials science majors
- Course taught via lectures and hands-on laboratory experiences

Guest Lecturer for NE 541: "Radiation Damage in Metals" **Fall 2009**
- Lecture: *"Microstructure Fundamentals"*

SUMMARY OF TEACHING EVALUATIONS WHILE AT U. OF MICHIGAN

Course #	Term	Enrolled/ Response	Course Qual. Avg. (Field/CoE Avg.)	Instructor Quali. Avg. (Field/CoE Avg.)	Q2
NERS290[a,b]	Winter 2020	6/16	4.63/4.23	4.53/4.70	4.5/4.6
NERS521	Fall 2019	6/6	4.60/4.57	4.90/4.77	4.9/4.6
NERS521[c]	Fall 2020	10/12	4.36/NA	4.73/NA	4.9/NA

- Evaluations are on a 5 point scale where 5 is Strongly Agree and 1 is Strongly Disagree
- Course Quality Average is composed of (i) this course advanced my understanding of the subject matter, (ii) my interest in the subject has increased becasue of this course, (iii) I knew what was expected of me in this course
- Instructor Quality Average is composed of (i) The instructor explained material clearly, (ii) the instructor treated students with respect, (iii) the instructor seemed well prepared for class meetings

– Q2. The instructor was an excellent teacher
– [a]This course is taught by committee, the scores reflect the composite of the instructors
– [b]This course transitioned to remote teaching mid-term due to COVID-19 pandemic
– [c]This course was taught synchronous remote due to COVID-19 pandemic

Teaching Evaluations While at U. of Michigan

Course #	Term	Q1	Q1631	Q1632	Q1633	Q2	Q199	Q217	Q230	Q4	Q891
NERS290[a,b]	Winter 2020	4.8	4.8	4.3	4.8	4.5	4.8	4.5	4.3	4.8	4.8
NERS521	Fall 2019	3.8	4.5	4.8	4.5	4.9	4.9	4.9	4.9	4.8	3.3

– Evaluations are on a 5 point scale where 5 is Strongly Agree and 1 is Strongly Disagree
– Q1. This was an excellent course.
– Q1631. This course advanced my understanding of the subject matter.
– Q1632. My interest in the subject has increased because of this course.
– Q1633. I knew what was expected of me in this course.
– Q2. The instructor was an excellent teacher.
– Q199. The instructor explained material clearly.
– Q217. The instructor treated students with respect.
– Q230. The instructor seemed well prepared for class meetings.
– Q4. I had a strong desire to take this course.
– Q891. As compared with other courses of equal credit, the workload for this course was (5 = Much Lighter, 4 = Lighter, 3 = Typical, 2 = Heavier, 1 = Much Heavier).
– [a]This course is taught by committee, the scores reflect the composite of the instructors
– [b]This course transitioned to remote teaching mid-term due to COVID-19 pandemic

Ph.D. Committee Activity

Chair

[1] Matthew Lynch, 2025, TBD.
Student Current Position: Pre-candidacy PhD student, University of Michigan

Co-Chair

[2] T.M. Kelsy Green, 2023, TBD.
Student Current Position: Pre-candidacy PhD student, University of Michigan
2 awards obtained

[3] Pengyuan Xiu, 2021, TBD.
Student Current Position: PhD candidate, University of Michigan

Member

[4] Li-Jen Yu, 2020, TBD.
Student Current Position: PhD candidate, University of Michigan

[5] Dr. Samuel Briggs, 2016, "Correlative Microscopy of α' Precipitation in Neutron-Irradiated Fe-Cr-Al Alloys", University of Wisconsin - Madison
Student Current Position: Assistant Professor, Oregon State University
6 journal publications, 2 awards obtained

Other Scholarly Advising

M.S. Students

[1] Gabriella Bruno, 2019-2021, Simulation of neutron irradiation in HT-9 using ion beams.
1 contribution to report.

[2] Mingren Shen, 2018-2019, Automated defect detection in electron microscopy images.
University of Wisconsin - Madison. Primary advisor: Dr. Dane Morgan.
1 report produced.

Post Doctoral Fellows

[3] Dr. Dalong Zhang, 2017 to 2019, Radiation effects in Generation II FeCrAl alloys.
Oak Ridge National Laboratory
2 journal publication produced

Student Interns

[4] Wei Li, Summer 2017, Automated defect detection in electron microscopy images.
Graduate student in Materials Science, University of Wisconsin - Madison. Primary advisor: Dr. Dane Morgan.
1 journal publication produced.

[5] Dr. Jack Haley, Summer 2016, Dislocation loop nature in neutron and in-situ ion irradiated FeCrAl alloys.
Graduate student in Nuclear Engineering, University of Oxford. Primary advisor: Dr. Steve Roberts.
1 journal publication produced.

[6] Dr. Stephen Taller, Summer 2016, Simulation of high dose neutron damage using dual-beam ion beam irradiations.
Graduate student in Nuclear Engineering, University of Michigan - Ann Arbor. Primary advisor: Dr. Gary S. Was.
2 journal publication produced.

[7] Zachary Thompson, Summer 2015, Aging of Fe-Cr-Al simple alloys for nuclear applications. Undergraduate student in Materials Science and Engineering, University of Alabama. Primary advisor: Dr. Kurt Terrani. .

[8] Sean Gray, Summer 2013, Design and evaluation of an *in-situ* tensile holder for TEM investigations.
Undergraduate student in Nuclear Engineering, University of Michigan. Primary advisor: Dr. Jeremy T. Busby.
1 publication produced.

[9] Todd Sherman, Summer 2013, Literature search and laboratory support on radiation effects in concrete.
Graduate student in Nuclear Engineering, Idaho State University. Primary advisor: Dr. Jeremy T. Busby.

STUDENT AWARDS

[1] T.M. Kelsy Green, Best Poster Award for, "Radiation tolerant materials for advanced nuclear reactors", U.S. Clean Energy Education and Empowerment (C3E) Initiative annual symposium, 2020.

[2] T.M. Kelsy Green, One of two to receive the 2020 Scholarship for the International Symposium on Superalloys, The Minerals, Metals, & Materials Society, 2020.

[3] T.M. Kelsy Green, Best Paper Award for: "Microstructrual tailoring of ferritic/martensitic Grade 91 steel using wire arc additive manufacturing", International Youth Nuclear Congress (IYNC), 2020.

[4] Tommy (Chun Yin) Wong & Aunic Goodin (NERS492 advised undergraduates), Selected finalist for: "Feasibility of SiC cladding for small modular reactors", ANS Virtual Conference Senior Design Competition, 2020.

[5] T.M. Kelsy Green, Best Poster Award-Industry Choice for: "Optimizing Additive Manufacturing for Advanced Nuclear Reactors", 7th Annual Oak Ridge Postgraduate Research Symposium, 2019.

[6] Samuel Briggs, Microscopy & Microanalysis Scholar Award, 2016.

[7] Samuel Briggs, Best Student Poser Award for: "Dependencies of α' embrittlement in neutron-irradiated model Fe-Cr-Al alloys", Nuclear Fuels & Structural Materials Conference, 2016.

University & Department Service

University Service

– Member, University of Michigan Radiation Policy Committee

College Service

– Organizer, MMRI Seed Funding Competition

Department Service

– Member, NERS Undergraduate Program Committee
– Member, NERS Safety Committee
– Member, NERS Materials Option

Professional Service

Community Outreach

– Organizing Committee, Materials in Nuclear Energy Systems Conference, American Nuclear Society & The Minerals, Metals & Materials Society, October 6-10, 2019.
– Track Co-chair, The Nuclear Materials Conference, Elsevier, October 14-18, 2018.
– Program Co-chair, Embedded Topical Nuclear Fuels & Structural Materials for Next Generation Nuclear Reactors, American Nuclear Society, June 17-21, 2018.
– Local co-coordinator of the 2016 Modeling, Experimentation, and Validation (MeV) Summer School, hosted at Oak Ridge National Laboratory, July 18-28, 2016

Committee Service

– Executive Committee Member, Materials Science and Technology Division of ANS (elected)

Editorial Service

– Guest Editor for *Journal of Nuclear Materials: Special Issue: Additive Manufacturing for Nuclear Energy Applications*, Current
– Guest Editor for *Nuclear Materials and Energy: Special Issue: Proceedings of Nineteenth International Conference on Fusion Reactor Materials*, 2019-2020

Referee Service

– *Journal of Nuclear Materials (~3 reviews/year)*
– *Ultramicroscopy (~1 reviews/year)*
– *Acta Materialia/Scripta Materialia/Materialia (~2-3 reviews/year)*
– *Nuclear Fuels and Structural Materials for Next Generation Nuclear Reactors Embedded Topical Meeting at the 2014 American Nuclear Society Annual Meeting*
– *Sixth International Symposium on Small Specimen Testing Techniques*
– *2013 American Nuclear Society Winter Meeting*
– *16th International Conference on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors*