

Yan-Ru Lin

R&D Associate Scientist | Oak Ridge National Laboratory
Oak Ridge, TN 37830 | liny@ornl.gov | 865-341-0182

PROFILE

Over a decade of research expertise in nuclear materials and electron microscopy. Research focuses on understanding radiation damage effects in neutron and ion irradiated materials primarily using transmission electron microscopy (TEM). Expertise in development and application of aberration-corrected STEM, in-situ TEM, and 4D-STEM techniques.

EXPERIENCE

▪ Oak Ridge National Laboratory, Oak Ridge, TN

R&D Associate Scientist — 2023–Present

Lead international collaborative research on post-irradiation examination of radioactive materials, focusing on the development of advanced characterization techniques to evaluate material properties. Emphasize understanding degradation mechanisms and mechanical property loss in materials for fusion and next-generation fission reactors.

Postdoctoral Research Associate — 2022–2023

Conducted research on radiation effects in nuclear structural materials. Installed the world's first liquid electrochemical cell with electron dose monitoring for in-situ TEM experiments. Pioneered flash polishing for FIB damage-free TEM sample preparation. Developed a machine learning model for automated defect detection, created a novel SRIM-like code for radiation damage calculations, and implemented STEM-WBDF techniques for advanced defect analysis.

▪ University of Tennessee, Knoxville, TN

Bredesen Center Joint Faculty — 2024–Present

Supervise two PhD students and deliver guest lectures in nuclear engineering and materials science.

EDUCATION

Ph.D., Materials Science & Engineering, University of Tennessee, Knoxville (2017-2021)

M.S., Nuclear Engineering, National Tsing Hua University, Taiwan (2012-2014)

B.S., Nuclear Engineering, National Tsing Hua University, Taiwan (2008-2012)

AWARDS

2025	MSTD Protégé of the Year Award	Oak Ridge National Laboratory
2024	R&D 100 Finalists	R&D World
2021	Mark Mills Award	American Nuclear Society
2021	Tickle Graduate Fellowship	University of Tennessee
2021	Professional Promise Distinction Award	University of Tennessee
2020	CMP Graduate Research Support	Tennessee Higher Education Commission
2019	MSE GRA Travel Award	University of Tennessee
2019	MeV Summer School Scholarship	U.S. Department of Energy
2018	Phi Kappa Phi	Honor Society of Phi Kappa Phi
2013	College of Science Elite Student Award	National Tsing Hua University
2012	NSRRC Research Fellowship	Taiwan Synchrotron Radiation Center
2012	Graduate Research Scholarship	Taiwan Bureau of Energy

PEER-REVIEWED JOURNAL ARTICLES

(citations=757, h-index=15, i10-index=21 on [Google Scholar](#))

1. Q. Chen, **Y. Lin**, P. Zhu, R. Thier, S. Chen, Z. Qi, Y. Zhao, L. Wang, N.K. Nagaraja, S. Ravikumar, V.K. Vasudevan, S.J. Zinkle, "Microstructural Evolution and Hardness Changes in Ion irradiated Nickel-based Haynes 282 Superalloy", *Journal of Nuclear Materials* (2025) 156006
2. **Y. Lin**, T. Koyanagi, S.J. Zinkle, L.L. Snead, Y. Katoh, "Perspectives and challenges of ultra-high temperature ceramics for fusion plasma-facing applications", *Current Opinion in Solid State & Materials Science* 36 (2025) 101223
3. T. Byun, **Y. Lin**, D.A. Collins, H.C. Hyer, K. Epps, K. Krogh, "Mechanical Characteristics of Additively Manufactured ODS 316L and 316H Alloys with and Without Post-build Processing", *JOM* (2025) 1-16
4. **Y. Lin**, S. Calzada, C.M. Parish, C.M. Petrie, "Origins of Radiation-Induced Optical Attenuation in Neutron-Irradiated Single-Crystal Sapphire at Elevated Temperatures", *Journal of Nuclear Materials* (2025) 155695
5. A. Perrin, P. Fernandez-Zelaia, C. Ledford, **Y. Lin**, E. Berry, R. Dehoff, M. Kirka, Y. Yang, "Design of silicide-strengthened Nb-Si-Cr-(Mo) alloys for additive manufacturing", *Materials & Design* (2025) 113616
6. K.D. Owensby, J. Ock, R. Sahore, H.M. Meyer III, E.C. Self, **Y. Lin**, W. Tsai, X.C. Chen, "The Impact of Lithium Anode Interface on Capacity Fade in Polymer Electrolyte-Based Solid-State Batteries", *ACS Applied Energy Materials* 7, 22 (2024) 10271-10280
7. J. Brechtel, M. Moses-DeBusk, **Y. Lin**, T. Lowe, J. Keiser, M.S. Kesler, K. Nawaz, "Corrosion Behavior of a Reactive Bond Between Stainless Steel and a Cast AlCeMg Alloy", *International Journal of Metalcasting* 1 (2024) 13
8. **Y. Lin**, Y. Zhao, Y. Su, T. Byun, "Cost-Effective Thermomechanical Processing of Nanostructured Ferritic Alloys: Microstructure and Mechanical Properties Investigation", *Materials* 17, 19 (2024) 4763
9. J.D. Arregui-Mena, T. Koyanagi, D.A. Cullen, M.J. Zachman, **Y. Lin**, P.D. Edmondson, Y. Katoh, "Comprehensive characterization of the irradiation effects of glassy carbon", *Acta Materialia* 281(2024) 120441
10. **Y. Lin**, Y. Zhao, M. J. Zachman, J.D. Arregui-Mena, M.G. Burke, S.J. Zinkle, "Understanding Formation of Irradiation-Induced Defects through 4D-STEM, Electron Tomography, and WBDF-STEM", *Microscopy and Microanalysis* 30(suppl 1) (2024) 269-270.
11. **Y. Lin**, Y. Li, S.J. Zinkle, J.D. Arregui-Mena, M.G. Burke, "Application of Weak-Beam Dark-Field STEM for Dislocation Loop Analysis", *Microscopy and Microanalysis* 30,4 (2024) 681-691
12. **Y. Lin**, T. Koyanagi, D.J. Sprouster, C.M. Petrie, W. Fahrenholtz, G.E. Hilmas, Y. Katoh, "Response of ^{11}B Enriched ZrB_2 Ultra-High Temperature Ceramic to Neutron Irradiation at Elevated Temperatures", *Acta Materialia* 276 (2024) 120111
13. P. Zhu, **Y. Lin**, S. Agarwal, V. Pauly, S. Taller, S.J. Zinkle, "Comparison of hardening and microstructures of ferritic/martensitic steels irradiated with fast neutrons and dual ions", *Journal of Nuclear Materials* 599 (2024) 155211.
14. T. Byun, T.G. Lach, **Y. Lin**, D.A. Collins, K. Epps, D.T. Hoelzer, "Characteristics of oxide-dispersion strengthened alloys produced by high-temperature severe deformation", *Journal of Nuclear Materials* 597 (2024) 155129.
15. Z. Yu, **Y. Lin**, M.J. Zachman, S.J. Zinkle, H. Xu, "The role of stacking fault tetrahedra on void swelling in irradiated copper", *Communications Materials* 5, 53 (2024)
16. C.P. Massey, C.K. Goetz, **Y. Lin**, J. Werden, S. Curlin, T.I. Siggillino, S.J. Zinkle, J.T. Busby, "Post-irradiation examination of commercial tantalum alloys following neutron irradiation", *Journal of Nuclear Materials* (2024) 154906

17. P. Zhu, Y. Zhao, **Y. Lin**, J. Henry, S.J. Zinkle, "Defect-specific strength factors and superposition model for predicting strengthening of ion irradiated Fe18Cr alloy", *Journal of Nuclear Materials* 588 (2024) 154823
18. **Y. Lin**, S.J. Zinkle, C.J. Ortiz, J-P, Crocombette, R. Webb, R.E. Stoller "Predicting displacement damage for ion irradiation: Origin of the overestimation of vacancy production in SRIM full-cascade calculations", *Current Opinion in Solid State and Materials Science* 27-6 (2023) 101120
19. Y. Li, M. Song, P. Zhu, **Y. Lin**, Z. Qi, Y. Zhao, S. Levine, S.J. Zinkle, "Flash electropolishing of BCC Fe and Fe-based alloys", *Journal of Nuclear Materials* (2023) 154672
20. S. Agarwal, A. Sawant, M. Faisal, S.E. Copp, J. Reyes-Zacarias, **Y. Lin**, S.J. Zinkle, "Application of a deep learning semantic segmentation model to helium bubbles and voids in nuclear materials", *Engineering Applications of Artificial Intelligence* 126A (2023) 106747
21. **Y. Lin**, A. Bhattacharya, S.J. Zinkle, "Analysis of position-dependent cavity parameters in irradiated metals to obtain insight into fundamental defect migration phenomena", *Materials & Design* 226 (2023) 111668
22. Q. Chen, Y. Cui, C. Zheng, **Y. Lin**, S.J. Zinkle, "A deep learning model for automatic analysis of cavities in irradiated materials", *Computational Materials Science* 221 (2023) 112073
23. **Y. Lin**, A. Bhattacharya, D. Chen, Y. Zhao, J. Kai, J. Henry, S.J. Zinkle, "The role of Cr concentration and temperature on cavity swelling with co-injected helium in dual ion irradiated Fe and Fe-Cr alloys", *Materials & Design* 223 (2022) 111134
24. **Y. Lin**, A. Bhattacharya, S.J. Zinkle, "The effect of helium on cavity swelling in dual-ion irradiated Fe and Fe-10Cr ferritic alloys", *Journal of Nuclear Materials* 569 (2022) 153907
25. Z. Yan and **Y. Lin**, "The effect of sink strength on helium bubble formation at elevated temperatures", *Nuclear Analysis* 1 (2022) 100003
26. **Y. Lin**, W. Chen, L. Tan, D.T. Hoelzer, Z. Yan, C. Hsieh, C. Huang, S.J. Zinkle, "Bubble formation in helium-implanted nanostructured ferritic alloys at elevated temperatures", *Acta Materialia* 217 (2021) 117165
27. S. Agarwal, **Y. Lin**, C. Li, R.E. Stoller, S.J. Zinkle, "On the use of SRIM for calculating vacancy production: Quick calculation and Full-cascade options", *Nuclear Instruments and Methods in Physics Research Section B* 503 (2021) 11-29
28. **Y. Lin**, W. Chen, M. Li, J. Henry, S.J. Zinkle, "Dynamic observation of dual-beam irradiated Fe and Fe-10Cr alloys at 435°C", *Acta Materialia* 209 (2021) 116793
29. **Y. Lin**, A. Bhattacharya, D. Chen, J. Kai, J. Henry, S.J. Zinkle, "Temperature-dependent cavity swelling in dual-ion irradiated Fe and Fe-Cr ferritic alloys", *Acta Materialia* 207 (2021) 116660
30. Z. Yan, T. Yang, **Y. Lin**, Y. Lu, Y. Su, S.J. Zinkle, Y. Wang, "Effects of temperature on helium bubble behavior in Fe-9Cr alloy", *Journal of Nuclear Materials* 532 (2020) 152045
31. J. Brechtel, H. Wang, N. Kumar, T. Yang, **Y. Lin**, H. Bei, J. Neuefeind, W. Dmowski, S.J. Zinkle, "Investigation of the thermal and neutron irradiation response of BAM-11 bulk metallic glass", *Journal of Nuclear Materials* 526 (2019) 151771
32. K. Fung, **Y. Lin**, P. Yu, J. Kai, A. Hu "Microscopic origin of black spot defect swelling in single crystal 3C-SiC", *Journal of Nuclear Materials* 508 (2018) 292-298
33. **Y. Lin**, L. Chen, C. Hsieh, M. Chang, S. Lo, F. Chen, J. Kai, "Atomic structure of nano voids in irradiated 3C-SiC", *Journal of Nuclear Materials* 498 (2018) 71-75
34. **Y. Lin**, L. Chen, C. Hsieh, M. Chang, K. Fung, A. Hu, S.C. Lo, F. Chen, J. Kai, "Atomic configuration of point defect clusters in ion-irradiated silicon carbide", *Scientific Reports* 7 (2017) 14635
35. **Y. Lin**, C. Ku, C. Ho, W. Chuang, S. Kondo, J. Kai, "Irradiation-induced microstructural evolution and swelling of 3C-SiC", *Journal of Nuclear Materials* 459 (2015) 276-283

36. **Y. Lin**, C. Ho, W. Chuang, C. Ku, J. Kai, "Swelling of ion-irradiated 3C-SiC characterized by synchrotron radiation based XRD and TEM", *Journal of Nuclear Materials* 455(1) (2014) 292-296
37. **Y. Lin**, C. Ho, C. Hsieh, M. Chang, S. Lo, F. Chen, J. Kai, "Atomic configuration of irradiation-induced planar defects in 3C-SiC", *Applied Physics Letters* 104(12) (2014) 121909

SPONSORED PROJECTS

(participated in 24 projects with total funding > \$30M)

1. **PI**, "4D-STEM strain mapping and atomic-resolution EELS of ion- and electron-irradiated titanium diboride ultra-high-temperature ceramics", CNMS Nanoscience Research Program, Project Number CNMS2025-R-03132, DOE - Oak Ridge National Laboratory: CNMS Facility Access, 2025
2. **PI**, "Atomic-Resolution Imaging of Dislocation Loops in ZrB₂ and TiB₂ Ultra-High-Temperature Ceramics", Center for Integrated Nanotechnologies User Proposal, Project Number 2024BU0100, DOE - Sandia National Laboratories: CINT Facility Access, 2025-2026
3. **Co-PI**, "Strain field evolution around MX precipitates in irradiated model ferritic alloys", Center for Integrated Nanotechnologies User Proposal, Project Number 2024BU0132, DOE - Sandia National Laboratories: CINT Facility Access, 2025-2026
4. **Key personnel**, "FIRE Collaborative: The Fusion Innovation Research Engine Integrated Materials Program to Accelerate Chamber Technologies (FIRE IMPACT)", DOE - Fusion Energy Sciences, 2024-2028
5. **Key personnel**, "Foundational Fusion Materials R&D Program", DOE - Fusion Energy Sciences, 2024-2027
6. **Co-PI**, "Material Characterization and Microanalysis" with Last Energy Inc, Voucher Opportunity - Performance Validation, Modeling, and Certification Support (OCED), DOE - Office of Technology Transitions, 2025-2026
7. **Key personnel**, "FRONTIER US-Japan Collaboration Program", DOE - Fusion Energy Sciences, 2024-2025
8. **Co-PI**, "MEMS-Enabled In Operando Spectroscopy And Imaging During Heating", Technology Commercialization Fund Core Laboratory Infrastructure for Market Readiness (CLIMR), DOE - Office of Technology Transitions, 2024-2027
9. **PI**, Bredesen Center PhD program fund, UT-Oak Ridge Innovation Institute, 2024-2025
10. **Co-PI**, "Materials Development, Validation, and Testing for Advanced Nuclear Reactors" with KVA Stainless, Technology Commercialization Fund - Voucher Provider Program, DOE - Office of Technology Transitions, 2024-2025
11. **Key personnel**, "EUROfusion Collaboration (KIT-ORNL) Program", DOE - Fusion Energy Sciences, 2023-2026
12. **Key personnel**, "UKAEA-ORNL Collaboration Program", DOE - Fusion Energy Sciences, 2023-2026
13. **PI**, "APT characterization of oxide dispersoids in additively manufactured 14YWT ferritic Alloys", CNMS Nanoscience Research Program, Project Number CNMS2023-R-02259, DOE - Oak Ridge National Laboratory: CNMS Facility Access, 2023-2024
14. **Key personnel**, "Advanced Sensors and Instrumentation program", DOE - Office of Nuclear Energy, 2023-2024
15. **Key personnel**, "Advanced Materials and Manufacturing Technologies Program", DOE - Office of Nuclear Energy, 2023-2024
16. **Co-PI**, "Electron tomography study of dislocation loops and precipitates in ion irradiated Fe-Cr alloys", Nuclear Science User Facilities - Rapid Turnaround Experiment

- (NSUF-RTE), Project Number 23-1905, DOE - Oak Ridge National Laboratory: LAMDA Facility Access, 2023-2024
17. **Co-PI**, “Microstructural characterization of C-C composites”, Nuclear Science User Facilities - Rapid Turnaround Experiment (NSUF-RTE), Project Number 23-1908, DOE - Oak Ridge National Laboratory: LAMDA Facility Access, 2023-2024
 18. **PI**, “4D-STEM and EELS study of defect bias and helium distribution in dual-ion irradiated Cu”, CNMS Nanoscience Research Program, Project Number CNMS2023-A-01757, DOE - Oak Ridge National Laboratory: CNMS Facility Access, 2023-2024
 19. **Co-PI**, “Examining microstructures and mechanical properties of neutron and ion irradiated T91, HT9 and 800H alloys”, Nuclear Science User Facilities - Rapid Turnaround Experiment (NSUF-RTE), Project Number 22-4456, DOE - Oak Ridge National Laboratory: LAMDA Facility Access, 2022-2023
 20. **Co-PI**, “Characterization on 2-D Petal-shaped loop and <001> loop formation mechanism”, CNMS Nanoscience Research Program, Project Number CNMS2022-B-01662, DOE - Oak Ridge National Laboratory: CNMS Facility Access, 2022-2023
 21. **PI**, “Fundamentals of Cavity Formation in α -Fe and Fe-Cr Alloys”, Tickle Graduate Fellowship, Tickle College of Engineering, University of Tennessee, 2021-2022
 22. **PI**, “SANS Characterization of Nanostructured Ferritic Alloys”, Spallation Neutron Source (SNS), Project Number IPTS-26783.1, DOE - Oak Ridge National Laboratory: BL-6 EQ-SANS Facility Access, 2021-2022
 23. **PI**, “Fundamentals of Cavity Formation in α -Fe and Fe-Cr Alloys”, Center for Materials Processing (CMP) Program, Tennessee Higher Education Commission, 2020-2022
 24. **PI**, “Bubble formation of in-situ He-implanted 14YWT and CNA advanced nanostructured ferritic alloys”, Nuclear Science User Facilities - Rapid Turnaround Experiment (NSUF-RTE), Project Number 19-1634, DOE - Argonne National Laboratory: IVEM Facility Access, 2019-2020

TECHNICAL REPORTS

1. T. Byun, D. A. Collins, H. C. Hyer, **Y. Lin**, K.L. Epps, K.M. Krogh, “Mechanical Performance of Additively Manufactured ODS 316L and 316H Stainless Steels”, U.S. DOE Office of Nuclear Energy, Advanced Materials and Manufacturing Technologies program, Annual Progress Report, ORNL/TM-2024/3538 (2024)
2. **Y. Lin**, R. Stoller, S. Zinkle, “Predicting Displacement Damage for Ion Irradiation: Origin of the Overestimation of Vacancy Production in SRIM Full-Cascade Calculations”, U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/75 (2024)
3. **Y. Lin**, S. J. Zinkle, J. D. Arregui-Mena, M. G. Burke, “Application of Weak-Beam Dark-Field STEM for Dislocation Loop Analysis”, U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/75 (2024)
4. **Y. Lin**, T. Koyanagi, C. Petrie, Y. Katoh, D. Sprouster, W. Fahrenholtz, G. Hilmas, “Response of ^{11}B Enriched ZrB_2 Ultra-High Temperature Ceramic to Neutron Irradiation at Elevated Temperatures”, U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/75 (2024)
5. T.S. Byun, T. Lach, **Y. Lin**, “Mechanical and Microstructural Characteristics of Low-Cost ODS Alloys”, U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/75 (2024)
6. **Y. Lin**, T. Koyanagi, C. Petrie, Y. Kato, D. Sprouster, L.L. Snead, “Dimensional stability of neutron-irradiated Boron-11 enriched zirconium diboride”, U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/74 (2023)

7. T. Byun, T. Lach, **Y. Lin**, D. Collins, D. Hoelzer, "Basic characteristic of low-cost ODS alloys", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/74 (2023)
8. **Y. Lin**, T. Byun, "Impact of helium on the neutron irradiation response of isotropically tailored F82H RAFM steel at 86 dpa", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/74 (2023)
9. D. Collins, **Y. Lin**, K. Hanson, T. Byun, "Feasibility Studies and Downselection of New Materials and Manufacturing Technologies for Nuclear Applications", U.S. DOE, ORNL/TM-2023/3094 (2023)
10. T. Byun, D. Collins, B. Fillingim, T. Feldhausen, H. Hyer, **Y. Lin**, D.T. Hoelzer, K. Hanson, "Downselection and Basic Properties of Additively Manufactured ODS Alloys", U.S. DOE, ORNL/TM-2023/3033 (2023)
11. **Y. Lin**, T. Koyanagi, C.M. Petrie, M.G. Burke, Y. Katoh, "Microstructure of neutron-irradiated Boron-11 enriched Zirconium diboride at elevated temperatures", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/73 (2022)
12. Y Li, Y. Zhao, S.J. Zinkle, A. Bhattacharya, **Y. Lin**, "Irradiation-induced dislocation loop decoration and atomic structure of the petal shaped dislocation loops in Fe-Cr alloys", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/72 (2022) 116-122
13. **Y. Lin** and S.J. Zinkle, "Bubble formation of in-situ He-Implanted 14YWT and CNA advanced nanostructured ferritic alloys", U.S. DOE Office of Nuclear Energy, Nuclear Science User Facility, Annual Report, (2021) 62-65
14. **Y. Lin**, S.J. Zinkle, L. Tan, D.T. Hoelzer, "Bubble formation on helium-implanted nanostructured ferritic alloys at elevated temperatures", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/70 (2021) 136-137
15. **Y. Lin**, S.J. Zinkle, D.T. Hoelzer, L. Tan, "Effect of helium on cavity swelling in dual-ion irradiated high purity iron-chromium alloys", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/70 (2021) 125-130
16. **Y. Lin**, S.J. Zinkle, D.T. Hoelzer, L. Tan, "STEM study of helium-implanted nanostructured ferritic alloys", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/69 (2020) 56-58
17. **Y. Lin**, S.J. Zinkle, W. Chen, M. Li, "Dynamic observation of dual-beam irradiated Fe and Fe-10Cr alloys at 435°C", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/69 (2020) 177
18. **Y. Lin**, S.J. Zinkle, A. Bhattacharya, "Temperature-dependent cavity swelling in dual-ion irradiated Fe and Fe-Cr ferritic alloys", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/69 (2020) 178-179
19. **Y. Lin**, A. Bhattacharya, J. Henry, S.J. Zinkle, "Study of the void swelling in ion irradiated high-purity Fe and Fe-Cr alloys", University of Michigan, Michigan Ion Beam Laboratory (MIBL), Annual Report 2020, (2020) 35
20. **Y. Lin**, S.J. Zinkle, W. Chen, "Dislocation loop evolution of in-situ dual ion irradiated Fe and Fe-10Cr alloy", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/68 (2020) 7-10
21. **Y. Lin**, D.T. Hoelzer, L. Tan, S.J. Zinkle, "Bubble formation in helium-implanted nanostructured ferritic alloys at 500 and 700°C", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/67 (2019) 16-20
22. **Y. Lin**, S.J. Zinkle, D.T. Hoelzer, L. Tan, "Bubble formation behavior for in-situ He-implanted 14YWT and CAN advanced nanostructured ferritic alloys", U.S. DOE Office of

- Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/66 (2019) 20-23
23. **Y. Lin**, S.J. Zinkle, A. Bhattacharya, "Cavity denuded zone in dual beam irradiated Fe and FeCr alloys", U.S. DOE Office of Fusion Energy Science, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/66 (2019) 9-14
 24. **Y. Lin**, and S.J. Zinkle, "Cavity denuded zone in neutron-irradiated copper", U.S. DOE Office of Fusion Energy, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/65 (2018) 78-82
 25. **Y. Lin**, S.J. Zinkle, D.T. Hoelzer, L. Tan "Bubble formation in helium-implanted nanostructured 14YWT and CNA3 ferritic alloys at elevated temperatures", U.S. DOE Office of Fusion Energy, Fusion Materials, Semiannual Progress Report, DOE/ER-0313/65 (2018) 71-73

PRESENTATIONS

1. "Radiation Effects and Microstructural Analysis of Nuclear Materials", **University of Tennessee**, Knoxville, Tennessee, USA, March 2025. (Invited talk)
2. "Investigation of Microstructure and Mechanical Properties in Cost-Effective Thermomechanically Processed Nanostructured Ferritic Alloys", The Minerals, Metals & Materials Society (**TMS**) Meeting, Las Vegas, Nevada, USA, March 2025. (Oral)
3. "Radiation Effects and Microstructural Analysis of Nuclear Materials", **Hokkaido University**, Sapporo, Japan, March 2025. (Invited talk)
4. "Understanding Formation of Irradiation-Induced Defects through 4D-STEM, Electron Tomography, and WBDF-STEM", Microscopy & Microanalysis (**M&M**), Cleveland, Ohio, USA, July 2024. (Oral)
5. "The Response of ^{11}B Enriched ZrB₂ Ultra-high Temperature Ceramic to Neutron Irradiation at Elevated Temperatures", The 21st International Conference on Fusion Reactor Materials (**ICFRM**), Granada, Spain, October 2023. (Oral)
6. "Effect of Helium on Cavity Swelling in Dual-ion Irradiated Fe and Fe-10Cr Ferritic Alloys", The Minerals, Metals & Materials Society (**TMS**) Meeting, San Diego, California, USA, March 2023. (Oral)
7. "Helium Effects on Defect Evolution of In-situ Irradiated Additive-manufactured Grade 91 Steel", The Minerals, Metals & Materials Society (**TMS**) Meeting, San Diego, California, USA, March 2023. (Oral)
8. "Effect of electron beam water radiolysis on in-situ liquid cell TEM", Liquid Phase Electron Microscopy Gordon Research Conference (**GRC**), Ventura, California, USA, October 2022. (Poster)
9. "Effect of Cr and He on Cavity Swelling in Dual-Ion Irradiated High Purity Fe-Cr Alloys", The Minerals, Metals & Materials Society (**TMS**) Meeting, Anaheim, California, USA, March 2022. (Oral)
10. "Formation of cavities in Fe and Fe-Cr ferritic alloys", The Materials in Nuclear Energy Systems (**MiNES**) meeting, Philadelphia, USA, November 2021. (Oral)
11. "Effect of Helium on Cavity Swelling in Dual-Ion Irradiated High Purity Fe and Fe-Cr Alloys", The 20th International Conference on Fusion Reactor Materials (**ICFRM**), Online Event, November 2021. (Poster)
12. "Temperature-dependent Cavity Swelling in Dual-Ion Irradiated Fe and Fe-Cr Alloys", The Nuclear Materials Conference (**NuMat**), Online Event, October 2020. (Poster)
13. "Dynamic observation of dual-beam irradiated Fe and Fe-10Cr alloys", The Nuclear Materials Conference (**NuMat**), Online Event, October 2020. (Oral)
14. "Void Swelling in Ion-irradiated High-purity Fe and Fe-Cr alloys: Peak Swelling Temperature and Carbon Effect", The 19th International Conference on Fusion Reactor Materials (**ICFRM**), La Jolla, USA, October 2019. (Oral)

15. “Peak Swelling Temperature in Ion Irradiated High-purity Fe and Fe-Cr Alloys”, The Materials in Nuclear Energy Systems (**MiNES**) meeting, Baltimore, USA, October 2019. (Poster)
16. “Bubble formation in helium-implanted nanostructured 14YWT and CNA ferritic alloys at elevated temperatures”, The Nuclear Materials Conference (**NuMat**), 2018, Seattle, USA, October 2018. (Poster)
17. “Ion-irradiation-induced defect in 3C-SiC characterized by synchrotron radiation-based XRD and TEM”, The 16th International Conference on Fusion Reactor Materials (**ICFRM**), Aachen, Germany, October 2015. (Oral)
18. “The microstructure evolution and point defect-induced swelling in irradiated 3C-SiC”, The 17th International Conference on Fusion Reactor Materials (**ICFRM**), Beijing, China, October 2013. (Poster)
19. “Microstructural evolution of Hi-Niclon Type-S SiC composite under ion irradiation at elevated temperatures”, International Symposium on New Frontier of Advanced Si-Based Ceramics and Composites (**ISASC**), Seoul, Korea, March 2012. (Poster)

PROFESSIONAL ACTIVITIES

1. **Program Committee & Group Chair**, ‘22nd International Conference on Fusion Reactor Materials (ICFRM-22)’, Shizuoka, Japan, 2025
2. **Lead Symposium Organizer**, ‘Microscopy & Microanalysis (M&M)’, Milwaukee, WI, 2025-2026
3. **Technical Reviewer**, proposal review for Nuclear Science User Facilities (NSUF) - Rapid Turnaround Experiment (RTE) program, U.S. Department of Energy, 2024–present
4. **Technical Reviewer**, proposal review for Laboratory Directed Research & Development (LDRD) program, Oak Ridge National Laboratory, 2024–present
5. **Guest Editor**, ‘Materials’, Special Issue: Mechanical Behavior and Radiation Response of Materials, 2024–2025.
6. **Program Committee Co-Chair & Symposium Organizer**, ‘The 12th Vacuum and Surface Sciences Conference of Asia and Australia (VASSCAA-12)’, Taipei, Taiwan, 2024
7. **Symposium Session Chair**, ‘The Minerals, Metals & Materials Society (TMS) Meeting’, San Diego, CA, 2023

MENTORING AND TEACHING EXPERIENCE

1. **Hsujui Chang**, PhD student in Bredesen Center - Energy Science & Engineering, University of Tennessee, PhD advisor, 2024–Present
2. **Jose Tupayachi**, PhD student in Industrial Engineering, University of Tennessee, Co-advisor (with Dr. Xueping Li), 2025–Present

SOFTWARE PROJECTS

- **IRAD** (<https://code.ornl.gov/liny/irad>)
Developed a Monte Carlo simulation program using the binary collision approximation (BCA) to simulate ion transport in materials. Addressed the vacancy overestimation problem in SRIM by implementing replacement energy correction in IRAD. The program accurately calculates vacancies/displacements and implanted ion concentration based on total ion fluence.

PROFESSIONAL MEMBERSHIPS

The Minerals, Metals, and Materials Society (TMS), Microscopy Society of America (MSA), Microanalysis Society (MAS), and American Nuclear Society (ANS)

PEER-REVIEW SERVICE

Acta Materialia, Journal of Nuclear Materials, Microscopy and Microanalysis, Scientific Reports, Journal of Materials Science & Technology, Journal of Materials Science, Nuclear Instruments and Methods in Physics Research Section B.

SKILLS

Microscopy (TEM, SEM, FIB), Materials Characterization Techniques (XRD, APT, Metallography, SAXS, SANS), Mechanical Testing (Tensile Test & Nanoindentation), Accelerator Techniques (Ion Beam & Synchrotron Radiation), Programming Languages (MATLAB, Python, C++)

GRADUATE ADVISORS AND POSTDOCTORAL SPONSORS

1. **Prof. M. Grace Burke**, Oak Ridge National Laboratory (Postdoc advisor); currently at Idaho National Laboratory
2. **Prof. Steven J. Zinkle**, University of Tennessee, Knoxville (PhD advisor)
3. **Prof. Arunodaya Bhattacharya**, Oak Ridge National Laboratory (PhD co-advisor); currently at University of Birmingham
4. **Prof. Ji-Jung Kai**, National Tsing Hua University, Taiwan (MS advisor); currently at City University of Hong Kong
5. **Dr. Ching-Shun Ku**, National Synchrotron Radiation Center, Taiwan (MS co-advisor)