

CURRICULUM VITAE

JAMIESON BRECHTL

Oak Ridge National Laboratory

EDUCATION

Doctor of Philosophy, Energy Science and Engineering, 2019

University of Tennessee, Knoxville, TN Advisor:

Professor Steven J. Zinkle

Dissertation: Effects of Irradiation and Annealing on the Properties and Microstructure of Bulk Amorphous Alloys.

Master of Science, Nuclear Engineering and Engineering Physics, 2012

University of Wisconsin-Madison, Madison, WI Advisors:

Professors Todd R. Allen and Kumar Sridharan

Thesis: Development of Diffusion Barrier Coatings and Deposition Technologies for Mitigating Fuel Cladding Chemical Interactions.

Bachelor of Science, Nuclear Engineering, 2011

Additional Majors in Applied Mathematics & Physics

University of Wisconsin-Madison, Madison, WI

PROFESSIONAL EXPERIENCE

Buildings and Transportation Science Division | Oak Ridge, TN

Associate R&D Staff Member – Oak Ridge National Laboratory | 02/2023 – Present

Buildings and Transportation Science Division | Oak Ridge, TN

Postdoctoral Research Associate – Oak Ridge National Laboratory | 06/2019 – 01/2023

Bredesen Center for Interdisciplinary Research and Graduate Education | Knoxville, TN

Graduate Research Assistant – University of Tennessee | 02/2014 – 06/2019

Department of Nuclear Engineering and Engineering Physics, Madison WI

Graduate Research Assistant – University of Wisconsin-Madison | 05/2011 – 09/2012

AWARDS

1. 2024 UT Battelle Team Research Accomplishment Award.
2. 2024 R&D 100 Award.
3. Metals 2021 Highly Cited Paper Award (1st place).
4. 2019 UTK Chancellor's Citation for Extraordinary Professional Promise.

PROFESSIONAL SOCIETIES

1. The Minerals, Metals & Materials Society (TMS).

PATENT APPLICATIONS

1. J. Nanda, K. Nawaz, R.L. Sacci, A.M. Ullman, **J. BrechtI**, Multifunctional Materials for Combined Electrochemical and Thermal Energy Storage, US Patent App. 18/899,293.
2. J. D. Rendall, K. Nawaz, W. E. Asher, A. F. Elatar, J. Sun, **J. BrechtI**, X. Liu, K. An, M. Zhang, Density Controlled Phase-Changing Material (PCM) Spheres for Increased Heating Power and Optimal Delivery Temperature in Hot-Water Tanks, US Patent App. 17/890,791.

INVENTION DISCLOSURES

1. V.M. Rao, **J. BrechtI**, C.L. Cramer, K. Nawaz, A. Gomez, Scalable Gyroid-Nozzles for Low-Loss Flow Conditioning, ORNL Invention Disclosure 202505989, Record ID 81966700, Submitted 2025-7-3.
2. E. Krishnan, J. Manley, **J. BrechtI**, J.D. Rendall, K. Nawaz, M. Murugan, S. Kowalski, Horizontal Drain-Heat Recovery Unit with Increased Performance, ORNL Invention Disclosure 202505941, Record ID 81964760, Submitted 2025-4-30.
3. **J. BrechtI**, M. Kos, Enhanced Interlayer Bonding in Fused Deposition Modeling Three Dimensional Printing Using Ultraviolet Laser Treatment and Oxygen Inhibition Techniques, ORNL Invention Disclosure 202405832, Record ID 81959077, Submitted 2024-12-3.
4. J. Sun, A.F. Elatar, Y. Li, K. Nawaz, J.D. Rendall, S. Kowalski, M. Murugan, **J. BrechtI**, P. Wang, L. Gao, Enhance the Heat Transfer of Heat Pump Water Heater with Embedded Phase Change Material Thermal Energy Storage, ORNL Invention Disclosure 202405798, Record ID 81957416, Submitted 2024-9-26.
5. J.D. Rendall, K. Nawaz, M. Murugan, **J. BrechtI**, E.N. Krishnan, Enhancing Drain Water Heat Exchanger Performance by Increasing Wetted Surface Area, ORNL Invention Disclosure 202405705, Record ID 81955532, Submitted 2024-7-23.
6. J.D. Rendall, Y. Li, K. Nawaz, J. Sun, M. Murugan, E.N. Krishnan, **J. BrechtI**, Drain-Source Heat Pump Water Heater with improved storage and reliability, ORNL Invention Disclosure 202405712, Record ID 81955668, Submitted 2024-4-10.
7. K. Li, **J. BrechtI**, A. Jiang, K. Nawaz, Water-Based Supersorbent Materials Synthesis and its In-situ Coating for Dehumidification, ORNL Invention Disclosure 202305406, Record ID 81946303, Submitted 2023-12-4.

BOOKS

1. **J. BrechtI**, P.K. Liaw, (Eds.), High-Entropy Materials: Theory, Experiments, and Applications, Springer International Publishing, 2022.

BOOK CHAPTERS

1. M.A. Khan, **J. BrechtI**, High-Entropy Alloys as an Irradiation-Resistant Material: A Review, in: G. Yasin, M.A. Khan, M.A. Afifi, T.A. Nguyen, Y. Zhang (Eds.), High-Entropy Alloys Design, Manufacturing, and Emerging Applications, Elsevier, 2024: pp. 323-374.
2. M.A. Lebyodkin, T.A. Lebedkina, **J. BrechtI**, P.K. Liaw, Serrated Flow in Alloy Systems, in: **J. BrechtI**, P.K. Liaw (Eds.), High-Entropy Materials: Theory, Experiments, and Applications, Springer International Publishing, Cham, 2022: pp. 523-644.
3. Y. Shang, **J. BrechtI**, C. Pistidda, P.K. Liaw, Mechanical Behavior of High-Entropy Alloys: A Review, in: **J. BrechtI**, P.K. Liaw (Eds.), High-Entropy Materials: Theory, Experiments, and Applications, Springer International Publishing, Cham, 2022: pp. 435-522.

JOURNAL PUBLICATIONS

1. M. Muneeshwaran, **J. Brechtel**, K. Nawaz, C.-M. Yang, Enhanced pool boiling heat transfer using novel inverted trapezoid microgroove structures, *Thermal Science and Engineering Progress*, *accepted, in press*.
2. A. Raj, **J. Brechtel**, S. Mubassira, P.K. Liaw, S. Xu, Dislocation glide in $\text{Al}_{0.3}\text{CoCrFeNi}$: Insights from molecular dynamics and statistical analysis, *Materials Letters*, *accepted, in press*.
3. M. Fan, Y. Cui, X. Zhou, J. Chen, Y. Zhang, L. Sun, **J. Brechtel**, D. Fang, Q. Li, Q. Ding, H. Bei, P.K. Liaw, Y. Xue, X.-L. Wang, Y. Lu, Z. Zhang, Enhancing strength at elevated temperatures via dynamic high-density mobile dislocations in Mg alloys, *Journal of Magnesium and Alloys*, *accepted, in press*.
4. **J. Brechtel**, M. Moses-DeBusk, Y.-R. 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*, *accepted, in press*.
5. A. Elatar, J. Rendall, J. Sun, **J. Brechtel**, K. Nawaz, Charge Reduction and Performance Analysis of a Heat Pump Water Heater Using R290 as a Refrigerant—A Field Study, *Energies* 18(14) (2025) 3661.
6. M.A. Khan, **J. Brechtel**, L. Jingyuan, N. Radhika, Y. Zhang, P.K. Liaw, W.-B. Liao, M.A. Afifi, High strength and ductility in a lightweight AlTiNbZrTa refractory high-entropy alloy enabled by nanophase precipitation and solute segregation, *Matter* 8 (2025) 102204.
7. Y.S. Kim, T. Kang, S.-K. Hong, **J. Brechtel**, M. Lebyodkin, Y.-H. Cheng, E.-W. Huang, P.K. Liaw, S. Harjo, W. Gong, Fundamental mechanisms of discontinuous deformation in metals for cryogenic-environment applications, *Acta Mater.* 292 (2025) 120970.
8. Y. Wu, **J. Brechtel**, C. Li, P.K. Liaw, G. Geng, Y. Zhang, Serration behavior and brittle phase-induced mechanical transitions in wrought $\text{Al}_{0.3}\text{CoCrFeNi}$ high-entropy alloy from 100° C to 800° C, *Materials Science and Engineering: A* (2025) 148261.
9. H. Naseer, Y. Wang, M.A. Khan, **J. Brechtel**, M.A. Afifi, High strength–ductility synergy of as-cast B2-containing AlNbTaTiZr refractory high-entropy alloy under intermediate and dynamic strain rates, *Metals* 15(3) (2025) 249.
10. H. Cheng, Z. Wang, **J. Brechtel**, W. Wen, M. Zhang, Z. Wang, J. Qiao, A prediction model of failure threshold for shear deformation in a Zr-based bulk metallic glass, *Intermetallics* 177 (2025) 108602.
11. **J. Brechtel**, M.C. Martinez, B. Yoon, J. Cesarano, E. Lara-Curzio, K. Nawaz, Thermal shock resistance of additively manufactured alumina, *International Journal of Applied Ceramic Technology* 22(1) (2025) e14887.
12. M.A. Khan, M.A. Afifi, M.A. Hafeez, U.M. Chaudry, **J. Brechtel**, M. Zulfiqar, H.M.R. Tariq, M.A. Hussain, M. Kamran, M. ishtiaq, Evolution of microstructure, texture, and mechanical performance of Mg-13Gd-2Er-0.3 Zr alloy by double extrusion at different temperatures, *Archives of Civil and Mechanical Engineering* 25(1) (2025) 26.
13. M.A. Afifi, **J. Brechtel**, M. Hamza, Z. Nazir, T. Ahmad, M.A. Khan, Investigating the Microstructural Impact of Tensile Stretching on Al-Zn-Mg-Cu Alloys: Dislocation-Precipitate Interactions, *Journal of Materials Engineering and Performance* (2024) 1-9.
14. P. Ilani-Kashkouli, **J. Brechtel**, K. An, M. Kidder, C. Tsouris, C. Janke, S. Kowalski, C.-M. Yang, M. Muneeshwaran, M. Lamm, Demonstration of the carbon capture with building make-up air unit, *Energy and Buildings* (2024) 114966.
15. M.A. Afifi, M. Hamdy, **J. Brechtel**, M.A. Khan, I.S. Fahim, Enhancing mechanical properties of Al-Zn-Mg-Cu alloys: The impact of high strain rate compression and subsequent heat treatment on microstructural evolution, *Materials Today Communications* 40 (2024).

16. J. Wang, H.X. Guo, Z.M. Jiao, D. Zhao, X.Z. Chen, S.G. Ma, T.W. Zhang, X.H. Liu, G. Sha, J.W. Qiao, **J. Brechtel**, P.K. Liaw, Z.H. Wang, Coupling effects of temperature and strain rate on the mechanical behavior and microstructure evolution of a powder-plasma-arc additive manufactured high-entropy alloy with multi-heterogeneous microstructures, *Acta Mater.* 276 (2024).
17. M.A. Khan, **J. Brechtel**, M. Hamza, C. Feng, A. Mansoor, B. Jabar, P.K. Liaw, M.A. Afifi, Influence of high-strain-rate compression and subsequent heat treatment on (TiNbZr)₈₉(AlTa)₁₁ refractory high-entropy alloys: Dynamic-mechanical behavior and microstructural changes, *Materials & Design* (2024) 113062.
18. K. An, K. Li, C.M. Yang, **J. Brechtel**, D. Stamberg, M. Zhang, K. Nawaz, Direct air capture with amino acid solvent: Operational optimization using a crossflow air-liquid contactor, *AIChE Journal* (2024) e18429.
19. K. An, **J. Brechtel**, S. Kowalski, C.-M. Yang, M.K. Kidder, C. Tsouris, C. Janke, M. Lamm, K. Copenhaver, J. Thompson, T. Turnaoglu, B. Fricke, K. Li, X. Sun, K. Nawaz, A multifunctional rooftop unit for direct air capture, *Environmental Science: Advances* 3(6) (2024) 937-949.
20. **J. Brechtel**, A.M. Ullman, K. Li, G. Yang, J. Nanda, K. Nawaz, R.L. Sacchi, Phase change electrolytes for combined electrochemical and thermal energy storage, *Energy Rep.* 11 (2024) 3931–3940.
21. S. Dai, L. Liao, Y. Feng, W. Yao, Y. Cai, **J. Brechtel**, M.A. Afifi, M.A. Khan, R. Zhiying, J. Li, Investigation on microstructures, mechanical properties, and corrosion behavior of novel biodegradable Zn-xCu-xTi alloys after hot rolling fabricated by self-developed newly gradient continuous casting, *J. Mater. Res. Technol.* 30 (2024) 1426–1435.
22. **J. Brechtel**, J. Rendall, M. Zhang, M.R. Koehler, K. Nawaz, A.M. Momen, Compatibility of LaFe_{13-x-y}Mn_xSi_yH_{1.6} and eutectic liquid GaInSn alloy, *Magnetochemistry* 10(2) (2024) 13.
23. S. Yin, Z. Wang, **J. Brechtel**, H. Zhang, M. Zhang, J. Han, Z. Wang, J. Qiao, Shear band velocity and activation volume during shear deformation by acoustic emission in a Zr-based bulk metallic glass, *Journal of Non-Crystalline Solids* 625 (2024) 122767.
24. S. San, P. Adhikari, R. Sakidja, **J. Brechtel**, P.K. Liaw, W.-Y. Ching, Porosity modeling in a TiNbTaZrMo high-entropy alloy for biomedical applications, *RSC advances* 13(51) (2023) 36468-36476.
25. M. Lebyodkin, **J. Brechtel**, T. Lebedkina, K. Wen, P.K. Liaw, T. Shen, Scaling and complexity of stress fluctuations associated with smooth and jerky flow in FeCoNiTiAl high-entropy alloy, *Metals* 13(10) (2023) 1770.
26. K. An, K. Li, C.-M. Yang, **J. Brechtel**, K. Nawaz, A comprehensive review on regeneration strategies for direct air capture, *Journal of CO₂ Utilization* 76 (2023) 102587.
27. M.A. Khan, M. Hamza, **J. Brechtel**, Z. Nazir, N.A. Qaisrani, G. Yasin, T. Ahmad, W.-B. Liao, P.K. Liaw, M.A. Afifi, Development and characterization of a low-density TiNbZrAlTa refractory high entropy alloy with enhanced compressive strength and plasticity, *Materials Characterization* (2023) 113301.
28. **J. Brechtel**, X. Xie, R. Feng, G. Wang, C. Melcher, M. Zhuravleva, P. K. Liaw, Serrated flow in NaI:Tl scintillator crystals, *Journal of Materials Science & Technology*, 153 (2023) 120–127.
29. J. Sun, K. Nawaz, J. Rendall, A. Elatar, **J. Brechtel**, Heat pump water heater enhanced with phase change materials thermal energy storage: Modeling study, *International Communications in Heat and Mass Transfer* 146 (2023) 106917.
30. J. Rendall, **J. Brechtel**, K. Nawaz, A. Elatar, J. Sun, K. An, X. Liu, W. Asher, Experimental results of embedded phase change material capsules for increasing the performance of a wrapped heat pump water heater, *International Communications in Heat and Mass Transfer* 145 (2023) 106806.
31. **J. Brechtel**, R. Feng, P.K. Liaw, B. Beausir, H. Jaber, T. Lebedkina, M. Lebyodkin, Mesoscopic-scale complexity in macroscopically-uniform plastic flow of an Al_{0.3}CoCrFeNi high-entropy alloy, *Acta Mater.* 242 (2023) 118445.

32. W. Li, B. Wang, X. Huang, B. Liu, **J. Brechtel**, P.K. Liaw, Mechanical behavior and shear band of a powder-metallurgy-fabricated CoCrFeMnNi high-entropy alloy during high strain-rate deformation, *J. Mater. Res. Technol.* 21 (2022) 1461–1478.
33. Y. Li, W.-B. Liao, H. Chen, **J. Brechtel**, W. Song, W. Yin, Z. He, P.K. Liaw, Y. Zhang, A low-density high-entropy dual-phase alloy with hierarchical structure and exceptional specific yield strength, *Science China Materials* (2022) 1-13.
34. W.-R. Zhang, W.-B. Liao, P.K. Liaw, J.-L. Ren, **J. Brechtel**, Y. Zhang, Effects of transient thermal shock on the microstructures and corrosion properties of a reduced activation high-entropy alloy, *Journal of Alloys and Compounds*, 918 (2022) 165762.
35. J. Moon, E. Tabachnikova, S. Shumilin, T. Hryhorova, Y. Estrin, **J. Brechtel**, P.K. Liaw, W. Wang, K.A. Dahmen, A. Zargarani, J.W. Bae, H.-S. Do, B.-J. Lee, H.S. Kim, Deformation behavior of a Co-Cr-Fe-Ni-Mo medium-entropy alloy at extremely low temperatures, *Materials Today*. 50 (2021) 55–68.
36. **J. Brechtel**, M.R. Koehler, M.S. Kesler, H.B. Henderson, A.A. Baker, K. Li, J. Kiggans, K. Nawaz, O. Rios, A.M. Momen, Effect of composition on the phase structure and magnetic properties of ball-milled $\text{LaFe}_{11.71-x}\text{Mn}_x\text{Si}_{1.29}\text{H}_{1.6}$ magnetocaloric powders, *Magnetochemistry* 7(9) (2021) 132.
37. R.J. Lane, A.M. Momen, M.S. Kesler, **J. Brechtel**, O. Rios, K. Nawaz, R. Mirzaeifar, Developing an experimental-computational framework to investigate the deformation mechanisms and mechanical properties of Al-8Ce-10Mg alloys at micro and macroscales, *Materials Today Communications* 28 (2021) 102674.
38. J. Cheng, R. Lane, M.S. Kesler, **J. Brechtel**, X. Hu, R. Mirzaeifar, O. Rios, A.M. Momen, K. Nawaz, Experiment and non-local crystal plasticity finite element study of nanoindentation on Al-8Ce-10Mg alloy, *International Journal of Solids and Structures* 233 (2021) 111233.
39. J. Moon, E. Tabachnikova, S. Shumilin, T. Hryhorova, Y. Estrin, **J. Brechtel**, P.K. Liaw, W. Wang, K.A. Dahmen, H.S. Kim, Unraveling the discontinuous plastic flow of a Co-Cr-Fe-Ni-Mo multiprincipal-element alloy at deep cryogenic temperatures, *Physical Review Materials* 5(8) (2021) 083601.
40. **J. Brechtel**, Y. Li, K. Li, L. Kearney, K. Nawaz, A. Flores-Betancourt, M. Thompson, O. Rios, A.M. Momen, Structural, thermal, and mechanical characterization of a thermally conductive polymer composite for heat exchanger applications, *Polymers* 13(12) (2021) 1970.
41. C. Lee, **J. Brechtel**, P. K. Liaw, Research on bulk-metallic glasses and high-entropy alloys in Peter K. Liaw's group and with his colleagues. *Metallurgical and Materials Transactions A*, (2021).
42. N. Hua, W. Wang, Q. Wang, Y. Ye, S. Lin, L. Zhang, Q. Guo, **J. Brechtel**, P.K. Liaw, Mechanical, corrosion, and wear properties of biomedical Ti–Zr–Nb–Ta–Mo high entropy alloys, *Journal of Alloys and Compounds* 861 (2021) 157997.
43. **J. Brechtel**, S. Agarwal, X. Hu, D. Chen, M. Chancey, H. Bei, Y.Q. Wang, S.J. Zinkle, An exploratory study on helium mobility in amorphous and crystallized bulk metallic glasses, *J. Nucl. Mater.* 543 (2021) 152617.
44. C. Lee, Y. Chou, G. Kim, M.C. Gao, K. An, **J. Brechtel**, C. Zhang, W. Chen, J.D. Poplawsky, G. Song, Y. Ren, Y.-C. Chou, P.K. Liaw, Lattice-distortion-enhanced yield strength in a refractory high-entropy alloy, *Advanced Materials* 32(49) (2020) 2004029.
45. N. Hua, X. Hong, Z. Liao, Q. Wang, L. Zhang, Q. Guo, X. Ye, **J. Brechtel**, P.K. Liaw, A biocompatible Pd-based BMG with excellent corrosive-wear resistance for implant applications, *Intermetallics* 124 (2020) 106847.
46. **J. Brechtel**, S. Chen, C. Lee, Y. Shi, R. Feng, X. Xie, D. Hamblin, A.M. Coleman, B. Straka, H. Shortt, R.J. Spurling, P.K. Liaw, A review of the serrated-flow phenomenon and its role in the deformation behavior of high-entropy alloys, *Metals* 10(8) (2020) 1101.
47. W.-Y. Ching, S. San, **J. Brechtel**, R. Sakidja, M. Zhang, P.K. Liaw, Fundamental electronic structure

- and multiatomic bonding in 13 biocompatible high-entropy alloys, *npj Computational Materials* 6(1) (2020) 45.
48. B. Zhang, P.K. Liaw, **J. Brecht**, J. Ren, X. Guo, Y. Zhang, Effects of Cu and Zn on microstructures and mechanical behavior of the medium-entropy aluminum alloy, *Journal of Alloys and Compounds* 820 (2020) 153092.
 49. X. Yue, **J. Brecht**, F. Wang, Z. Chang, P.K. Liaw, C. Fan, Deformation behavior of annealed Cu₆₄Zr₃₆ metallic glass via molecular dynamics simulations, *Materials & Design* 191 (2020) 108660.
 50. **J. Brecht**, M.L. Crespillo, S. Agarwal, H. Bei, S.J. Zinkle, Effects of irradiation spectrum on the microstructural and mechanical properties of bulk metallic glasses, *J. Nucl. Mater.* 533 (2020) 152084.
 51. J. Wen, H. Che, R. Cao, H. Dong, Y. Ye, H. Zhang, **J. Brecht**, Y. Gao, P.K. Liaw, Evolution of the mechanical properties of a cobalt-based alloy under thermal shocks, *Materials & Design* 188 (2020) 108425.
 52. N. Hua, Z. Liao, Q. Wang, L. Zhang, Y. Ye, **J. Brecht**, P.K. Liaw, Effects of crystallization on mechanical behavior and corrosion performance of a ductile Zr₆₈Al₈Ni₈Cu₁₆ bulk metallic glass, *Journal of Non-Crystalline Solids* 529 (2020) 119782.
 53. **J. Brecht**, X. Xie, Z. Wang, J. Qiao, P.K. Liaw, Complexity analysis of serrated flows in a bulk metallic glass under constrained and unconstrained conditions, *Materials Science and Engineering: A* 771 (2020) 138585.
 54. **J. Brecht**, Z. Wang, X. Xie, J.-W. Qiao, P.K. Liaw, Relation between the defect interactions and the serration dynamics in a Zr-based bulk metallic glass, *Applied Sciences* 10(11) (2020) 3892.
 55. **J. Brecht**, S. Agarwal, M.L. Crespillo, J. Salasin, T. Yang, H. Bei, S.J. Zinkle, Investigation of the mechanical and microstructural evolution of a Cu based bulk metallic glass during ion irradiation, *Intermetallics* 116 (2020) 106655.
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 57. **J. Brecht**, S. Agarwal, M. L. Crespillo, T. Yang, H. Bei, Y. Zhang, S. J. Zinkle, Evolution of the microstructural and mechanical properties of BAM-11 bulk metallic glass during ion irradiation and annealing, *J. Nucl. Mater.* 523 (2019) 299-309.
 58. **J. Brecht**, X. Xie, P.K. Liaw, Investigation of chaos and memory effects in the Bonhoeffer-van der Pol oscillator with a non-ideal capacitor, *Commun. Nonlinear Sci. Numer. Simul.* 73 (2019) 195-216.
 59. **J. Brecht**, B. Chen, X. Xie, Y. Ren, J.D. Venable, P.K. Liaw, S.J. Zinkle, Entropy modeling on serrated flows in carburized steels, *Materials Science and Engineering: A* 753 (2019) 135-145.
 60. **J. Brecht**, S.Y. Chen, X. Xie, Y. Ren, J.W. Qiao, P.K. Liaw, S.J. Zinkle, Towards a greater understanding of serrated flows in an Al-containing high-entropy-based alloy, *International Journal of Plasticity* 115 (2019) 71-92.
 61. C. Lee, G. Song, M.C. Gao, R. Feng, P. Chen, **J. Brecht**, Y. Chen, K. An, W. Guo, J.D. Poplawsky, S. Li, A.T. Samaei, W. Chen, A. Hu, H. Choo, P.K. Liaw, Lattice distortion in a strong and ductile refractory high-entropy alloy, *Acta Mater.* 160 (2018) 158-172.
 62. **J. Brecht**, X. Xie, P.K. Liaw, S.J. Zinkle, Complexity modeling and analysis of chaos and other fluctuating phenomena, *Chaos, Solitons & Fractals* 116 (2018) 166-175.
 63. S. Chen, X. Xie, W. Li, **J. Brecht**, P. Li, G. Zhao, F. Yang, J. Qiao, and P. K. Liaw, Nanoscale serration and creep characteristics of Al_{0.5}CoCrCuFeNi high-entropy alloys, *Journal of Alloys and Compounds*, 752 (2018) 464-475.
 64. Y. Shi, B. Yang, X. Xie, **J. Brecht**, K.A. Dahmen, P.K. Liaw, Corrosion of Al_xCoCrFeNi high-entropy alloys: Al-content and potential scan-rate dependent pitting behavior, *Corros. Sci.* 119 (2017) 33-45.
 65. V. Firouzdor, **J. Brecht**, L. Wilson, B. Semerau, K. Sridharan, and T.R. Allen, Development of titanium diffusion barrier coatings for mitigation of fuel-cladding chemical interactions, *Surface and Coatings Technology* 219 (2013): 59-68.

66. V. Firouzdor, **J. Brechtel**, B. Hauch, K. Sridharan, and T. R. Allen, Electrophoretic deposition of diffusion barrier titanium oxide coatings for nuclear reactor cladding applications, *Applied Surface Science* 282 (2013): 798-808.
67. V. Firouzdor, **J. Brechtel**, L. Wilson, B. Semerau, K. Sridharan, and T. R. Allen, Development of yttrium stabilized zirconia (YSZ) diffusion barrier coatings for mitigation of fuel-cladding chemical interactions, *Journal of Nuclear Materials* 438, no. 1 (2013): 268-277.

EDITORIALS

1. **J. Brechtel**, C. Lee, P.K. Liaw, High-entropy materials: Fundamentals and applications, *Journal of Materials Research and Technology*, 23 (2023) 5967–5971.

CONFERENCE PAPERS

1. C.-M. Yang, M. Muneeshwaran, **J. Brechtel**, K. Nawaz, Heat transfer and visual observation of pool boiling of next-generation low-pressure refrigerant: R1336mzz(Z), 7th IIR Conference on Thermophysical Properties and Transfer Processes of Refrigerants, College Park, MD, USA, 2025.
2. **J. Brechtel**, M. Moses-Debusk, M.S. Kesler, Y.-R. Lin, E. Cakmak, T. Lowe, M. Thompson, J. Keiser, D. Weiss, K. Nawaz, Corrosion resistance of an AlCeMg/stainless-steel reactive bond, Springer Nature Switzerland, Cham, 2025, pp. 385-394.
3. K. Nawaz, **J. Brechtel**, M. Moses-Debusk, M.S. Kesler, On the corrosion response of novel heat exchangers manufactured by casting of Al-Ce-Mg alloy, 20th International Refrigeration and Air Conditioning Conference at Purdue - West Lafayette, Indiana, United States of America, 2024, p. Medium: ED.
4. M. Malhotra, E. Krishnan, J. Rendall, F. Casey, Y. Li, K. Nawaz, J. Sun, **J. Brechtel**, W. Worek, G. Klein, Cost reduction of heat pump water heating in cold climates for low to moderate income families, 8th International High Performance Buildings Conference at Purdue - West Lafayette, Indiana, United States of America, 2024, p. Medium: ED.
5. M. Muneeshwaran, C.-M. Yang, **J. Brechtel**, K. Nawaz, Microchannel geometries for improved heat transfer with low-GWP refrigerants, 20th International Refrigeration and Air Conditioning Conference at Purdue - West Lafayette, Indiana, United States of America, 2024, p. Medium: ED.
6. E. Krishnan, M. Muneeshwaran, J. Rendall, K. Nawaz, **J. Brechtel**, Performance evaluation of drain water heat recovery exchangers for heat pump water heaters, 20th International Refrigeration and Air Conditioning Conference at Purdue - West Lafayette, Indiana, United States of America, 2024, p. Medium: ED.
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