

Samuel A. Briggs, Ph.D.

CONTACT INFORMATION

Assistant Professor
School of Nuclear Science & Engineering
Oregon State University
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Samuel A. Briggs

QUALIFICATIONS

Assistant professor with 10+ years of experience studying radiation effects in materials for nuclear systems. Excels at utilization of analytical microscopy for advanced characterization and development of structure/property relationships in materials, collaborating with multidisciplinary research and design teams, and utilizing unique capabilities at scientific user facilities through successful proposal writing. U.S. citizen with established record of effective communication through internationally attended presentations and peer-reviewed publications.

RESEARCH EXPERIENCE

Assistant Professor **2018 to Present**
School of Nuclear Science & Engineering, Oregon State University

Highlights:

- General interest in materials degradation in advanced nuclear reactor environments. Currently investigating corrosion and crack propagation in materials under stress in liquid sodium and molten salt coolant environments. Research group has developed several autoclave and glove box corrosion cells for long-term mechanical and corrosion testing in these media.

Postdoctoral Appointee **2017 - 2018**

Radiation-Solid Interactions Department, Sandia National Laboratories

Supervisor: Dr. Khalid M. Hattar

Highlights:

- Assisted in iterative design and characterization of nanodispersed Cu-Nb thin films as model systems for study of radiation tolerant nanostructures.
- Analyzed material microstructure and behavior during in-situ TEM experiments, including radiation response, picroindentation/straining, and annealing.

Research Assistant **2011 - 2016**

Engineering Physics Department, University of Wisconsin - Madison

Graduate Advisors: Dr. Todd R. Allen & Dr. Kumar Sridharan

Thesis Topic: *Correlative microscopy of α' precipitation in neutron-irradiated FeCrAl alloys*

Highlights:

- Investigated composition and dose dependencies of precipitation phenomena affecting long-term operational exposure of FeCrAl alloys in neutron radiation environments using analytical electron microscopy, atom probe tomography and neutron scattering techniques.
- Developed new techniques to compensate for the effect of trajectory aberration artifacts on calculated phase composition based on quantifying the extent of artificial densification within reconstructed atom probe tomography data set.
- Compared effects of composition and irradiating ion species on microstructural evolution of ion irradiated Ni-Cr model alloys.

EDUCATION

University of Wisconsin - Madison, Madison, WI**2011 - 2016**

Ph.D., Nuclear Engineering & Engineering Physics, December 2016

– Graduate Advisors: Dr. Todd R. Allen & Dr. Kumar Sridharan

M.S., Nuclear Engineering & Engineering Physics, August 2013

Oregon State University, Corvallis, OR**2007 - 2011**

B.S., Nuclear Engineering, June 2011

– Honors: *Summa cum laude*

– Minors: Mathematics & Chemistry

REFEREED

JOURNAL

PUBLICATIONS

- [1] E. Getto, M. Johnson, M. Maughan, N. Nathan, J. McMahan, B. Baker, K. Knipping, **S.A. Briggs**, K. Hattar, M.J. Swenson. Friction stir welding and self-ion irradiation effects on microstructure and mechanical properties changes with oxide dispersion strengthened steel MA956. Submitted to *Materialia*, November 2021.
- [2] **S.A. Briggs**, M. Steckbeck, N.M. Heckman, T.A. Furnish, D.C. Bufford, D. Buller, B.L. Boyce, K. Hattar. A combined thermomechanical and radiation testing platform for a 6 MV tandem accelerator. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, Volume 509, December 2021, ISSN 0168-583X, <https://doi.org/10.1016/j.nimb.2021.08.011>.
- [3] D. Mangus, A. Napora, **S.A. Briggs**, M. Anderson, W.K. Nollet. Design and Demonstration of a Laboratory-Scale Oxygen Controlled Liquid Sodium Facility. *Nuclear Engineering and Design*, Volume 378, July 2021, ISSN 0029-5493, <https://doi.org/10.1016/j.nucengdes.2021.111093>.
- [4] C.P. Massey, D. Zhang, **S.A. Briggs**, P.D. Edmondson, Y. Yamamoto, M.N. Gussev, K.G. Field. Deconvoluting the effect of chromium and aluminum on the radiation response of wrought FeCrAl alloys after low-dose neutron irradiation. *Journal of Nuclear Materials*, Volume 549, June 2021, ISSN 0022-3115, <https://doi.org/10.1016/j.jnucmat.2021.152804>.
- [5] A. Ali, H.G. Kim, K. Hattar, **S. A. Briggs**, D.J. Park, J.H. Park, Y. Lee. Ion irradiation effects on Cr-coated zircaloy-4 surface wettability and pool boiling critical heat flux. *Nuclear Engineering and Design*, Volume 362, June 2020, ISSN 0029-5493, <https://doi.org/10.1016/j.nucengdes.2020.110581>.
- [6] J. D. Schuler, G. Copeland, K. Hattar, T. J. Rupert, **S. A. Briggs**. Solid-state dewetting instability in thermally-stable nanocrystalline binary alloys. *Materialia*, Volume 9, March 2020, ISSN 2589-1529, <https://doi.org/10.1016/j.mtla.2020.100618>.
- [7] 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, December 2019, ISSN 0022-3115, <https://doi.org/10.1016/j.jnucmat.2019.151784>.

- [8] B. J. Cowen, M. S. El-Genk, K. Hattar, **S. A. Briggs**. Investigations of irradiation effects in crystalline and amorphous SiC. *Journal of Applied Physics*, Volume 126, October 2019, 135902, ISSN 0021-8979, <https://doi.org/10.1063/1.5085216>.
- [9] B.W. Reed, A.A. Moghadam, R.S. Bloom, S.T. Park, A.M. Monterrosa, P.M. Price, C.M. Barr, **S.A. Briggs**, K. Hattar, J. McKeown, D.J. Masiel. Electrostatic subframing and compressive sensing video in *in situ* transmission electron microscopy. *Structural Dynamics*, Volume 6, September 2019, 054303, ISSN 2329-7778, <https://doi.org/10.1063/1.5115162>.
- [10] C.A. Taylor, **S.A. Briggs**, G. Greaves, A. Monterrosa, E. Aradi, J.D. Sugar, D.B. Robinson, K. Hattar, J. Hinks. Investigating helium bubble nucleation and growth through simultaneous in-situ cryogenic, ion implantation, and environmental transmission electron microscopy. *Materials*, Volume 12, August 2019, 2618, ISSN 1996-1944, <https://doi.org/10.3390/ma12162618>.
- [11] B. L. Doyle, S. B. Van Deusen, **S. A. Briggs**. Using high energy electrons for elastic recoil detection of hydrogen. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, Volume 450, July 2019, Pages 179-183, ISSN 0168-583X, <https://doi.org/10.1016/j.nimb.2018.10.016>.
- [12] E. Getto, B. Baker, B. Tobie, **S. A. Briggs**, K. Hattar, K. Knipling. Effect of friction stir welding and self-ion irradiation on dispersoid evolution in oxide dispersion strengthened steel MA956 up to 25 dpa. *Journal of Nuclear Materials*, Volume 515, March 2019, Pages 407-419, ISSN 0022-3115, <https://doi.org/10.1016/j.jnucmat.2018.12.040>.
- [13] B. J. Cowen, M. S. El-Genk, K. Hattar, **S. A. Briggs**. A study of irradiation effects in TiO₂ using molecular dynamics simulation and complementary in situ transmission electron microscopy. *Journal of Applied Physics*, Volume 124, August 2018, 095901, ISSN 0021-8979, <https://doi.org/10.1063/1.5045491>.
- [14] D. Zhang, **S. A. Briggs**, K. G. Field. Role of refractory inclusions of 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>.
- [15] K. G. Field, K. C. Littrell, **S. A. Briggs**. Precipitation of α' in neutron irradiated commercial FeCrAl alloys. *Scripta Materialia*, Volume 142, January 2018, Pages 41-45, ISSN 1359-6462, <https://doi.org/10.1016/j.scriptamat.2017.08.022>.
- [16] K. G. Field, **S. A. Briggs**, K. Sridharan, Y. Yamamoto, R. A. Howard. Dislocation loop formation in model FeCrAl alloys after neutron irradiation below 1 dpa. *Journal of Nuclear Materials*, Volume 495, November 2017, Pages 20-26, ISSN 0022-3115, <https://doi.org/10.1016/j.jnucmat.2017.07.061>.
- [17] J. Haley, **S. A. Briggs**, P. D. Edmondson, K. Sridharan, S. Roberts, S. Lozano-Perez, K. G. Field. Dislocation loop evolution during in-situ ion irradiation of model FeCrAl alloys. *Acta Materialia*, Volume 136, September 2017, Pages 390-401, ISSN 1359-6454, <https://doi.org/10.1016/j.actamat.2017.07.011>.

- [18] K. G. Field, **S. A. Briggs**, K. Sridharan, R. H. Howard, Y. Yamamoto. Mechanical properties of neutron-irradiated model and commercial FeCrAl alloys. *Journal of Nuclear Materials*, Volume 489, June 2017, Pages 118-128, ISSN 0022-3115, <https://doi.org/10.1016/j.jnucmat.2017.03.038>.
- [19] **S. A. Briggs**, P. D. Edmondson, K. C. Littrell, Y. Yamamoto, R. H. Howard, C. R. Daily, K. A. Terrani, K. Sridharan, K. G. Field. A combined APT and SANS investigation of α' phase precipitation in neutron-irradiated model FeCrAl alloys. *Acta Materialia*, Volume 129, May 2017, Pages 217-228, ISSN 1359-6454, <https://dx.doi.org/10.1016/j.actamat.2017.02.077>.
- [20] K. G. Field, **S. A. Briggs**, X. Hu, Y. Yamamoto, R. H. Howard, K. Sridharan. Heterogeneous dislocation loop formation near grain boundaries in a neutron-irradiated commercial FeCrAl alloy. *Journal of Nuclear Materials*, Volume 483, January 2017, Pages 54-61, ISSN 0022-3115, <https://dx.doi.org/10.1016/j.jnucmat.2016.10.050>.
- [21] **S. A. Briggs**, K. Sridharan, K. G. Field. Correlative microscopy of neutron-irradiated materials. *Advanced Materials & Processes*, Volume 174, Issue 10, November 2016, Pages 16-21, <http://mio.asminternational.org/amp/201610/#II>.
- [22] **S. A. Briggs**, C. M. Barr, J. Pakarinen, M. Mahmivand, K. Hattar, D. D. Morgan, M. Taheri, K. Sridharan. Observations of defect structure evolution in proton and Ni ion irradiated Ni-Cr binary alloys. *Journal of Nuclear Materials*, Volume 479, October 2016, Pages 48-58, ISSN 0022-3115, <https://dx.doi.org/10.1016/j.jnucmat.2016.06.046>.
- [23] P. D. Edmondson, **S. A. Briggs**, Y. Yamamoto, R. H. Howard, K. Sridharan, K. A. Terrani, K. G. Field. Irradiation-enhanced α' precipitation in model Fe-CrAl alloys. *Scripta Materialia*, Volume 116, April 2016, Pages 112-116, ISSN 1359-6462, <https://dx.doi.org/10.1016/j.scriptamat.2016.02.002>.
- [24] K. G. Field, M. N. Gussev, Y. Yamamoto, R. H. Howard, **S. A. Briggs**. Second annual progress report on radiation tolerance of controlled fusion welds in high temperature oxidation resistant FeCrAl alloys. *ORNL/TM-2016/770*, December 2016, <https://www.osti.gov/scitech/biblio/13385594>.
- [25] M. N. Gussev, K. G. Field, **S. A. Briggs**, Y. Yamamoto. Preliminary analysis of the general performance and mechanical behavior of irradiated FeCrAl base alloys and weldments. *ORNL/TM-2016/552*, September 2016, <https://www.osti.gov/scitech/biblio/1328330>.
- [26] K. G. Field, **S. A. Briggs**, P. D. Edmondson, J. C. Haley, R. H. Howard, X. Hu, K. C. Littrell, C. M. Parish, Y. Yamamoto. Database on performance of neutron irradiated FeCrAl alloys. FY-16 FCRD Milestone Report: *ORNL/TM-2016/335*, August 2016, <https://www.osti.gov/scitech/biblio/1295144>.
- [27] K. G. Field, **S. A. Briggs**, P. D. Edmondson, X. Hu, K. C. Littrell, R. H. Howard, C. M. Parish, Y. Yamamoto. Evaluation of the effect of composition on radiation hardening and embrittlement in model FeCrAl alloys. FY-15 FCRD Milestone Report: *ORNL/TM-2015/518*, September 2015, <https://www.osti.gov/scitech/biblio/1253237>.

PUBLISHED
REPORTS

BOOK CHAPTERS [28] K.G. Field, **S. A. Briggs**. Radiation Effects in FeCrAl Alloys for Nuclear Power Applications. In *Comprehensive Nuclear Materials*, Elsevier, July 2020, <https://www.sciencedirect.com/referencework/9780081028667/comprehensive-nuclear-materials>.

[29] **S. A. Briggs**, K. Hattar. Evolution of Gold Nanoparticles in Radiation Environments. In *Gold Nanoparticles - Reaching New Heights*, IntechOpen, November 2018, <https://doi.org/10.5772/intechopen.80366>.

PUBLISHED

CONFERENCE

ABSTRACTS

[30] G. Mignot, **S.A. Briggs**, C. Toledo-Torres, G. Young, A. Brittan, L. Teeter, A. Wojcik, M. Waitt, J.D. Tucker. In-Situ Mechanical and Corrosion Testing for Versatile Test Reactor Application. *ANS Transactions*, Volume 121, November 2019, Pages 1411-1414, <https://dx.doi.org/10.13182/T31062>.

[31] **S.A. Briggs**, A. Monterrosa, N. Heckman, C.M. Barr, T. Clark, L. Treadwell, B. Boyce, K. Hattar. Development of the In-Situ Ion Irradiation SEM at Sandia National Laboratories. *Microscopy & Microanalysis*, Volume 25, Supplement S2, August 2019, Pages 1596-1597, <https://doi.org/10.1017/S1431927619008717>.

[32] B.W. Reed, A.A. Moghadam, R.S. Bloom, S.T. Park, A.M. Monterrosa, P.M. Price, C.M. Barr, **S.A. Briggs**, K. Hattar, D.J. Masiel. Electrostatic Subframing and Compressive Sensing Video in in situ Transmission Electron Microscopy. *Microscopy & Microanalysis*, Volume 25, Supplement S2, August 2019, Pages 1468-1469, <https://doi.org/10.1017/S1431927619008079>.

[33] B.W. Reed, A.M. Monterrosa, A.A. Moghadam, R.S. Bloom, S.T. Park, **S.A. Briggs**, P.M. Price, C.M. Barr, J.T. McKeown, D. Masiel, K. Hattar. Initiation of Grain Growth Observed Using Electrostatic-Subframing. *Microscopy & Microanalysis*, Volume 25, Supplement S2, August 2019, Pages 1518-1519, <https://doi.org/10.1017/S1431927619008328>.

[34] **S. A. Briggs**, P. D. Edmondson, K. G. Field, Y. Yamamoto, K. C. Littrell, C. R. Daily, K. Sridharan. Complementary techniques for quantification of α' phase precipitation in neutron-irradiated Fe-Cr-Al model alloys. *Microscopy & Microanalysis*, Volume 22, Supplement S3, July 2016, Pages 1470-1471, <http://dx.doi.org/10.1017/S1431927616008199>.

[35] **S. A. Briggs**, P. D. Edmondson, K. C. Littrell, Y. Yamamoto, K. Sridharan, K. G. Field. Dependencies of α' embrittlement in neutron-irradiated model Fe-Cr-Al alloys. *ANS Transactions*, Volume 114, Number 1, June 2016, Pages 1046-1047, <http://epubs.ans.org/?a=38766>.

[36] K. G. Field, Y. Yamamoto, **S. A. Briggs**, M. N. Gussev, K. A. Unocic, B. A. Pint, R. B. Rebak, L. L. Snead, K. A. Terrani. Advancements in FeCrAl alloys for enhanced accident tolerant fuel claddings for light water reactors. *ANS Transactions*, Volume 114, Number 1, June 2016, Pages 975-976, <http://epubs.ans.org/?a=38737>.

INVITED
PRESENTATIONS

- [37] **S. A. Briggs**. "Materials Design and Engineering: Improving and Enabling Advanced Nuclear Technologies." Invited presentation at University of Florida, Virtual Seminar, October 2021.
- [38] **S. A. Briggs**. "Perspectives on Materials Degradation Challenges for Fission Battery Deployment." Invited presentation at the Fission Battery Workshop 2021, Virtual Workshop, February 2021.
- [39] K. Hattar, C. Barr, B. Muntifering, D. Bufford, C. Taylor, S. Foiles, F. Abdeljawad, **S.A. Briggs**. Complex Interactions of Grain Boundaries and Radiation Damage. Invited presentation at *Materials Science & Technology 2019*, Portland, OR, USA, October 2019.
- [40] **S. A. Briggs**. "Enabling Advanced Nuclear Reactor Technologies Through Materials Design and Engineering." Invited presentation at University of Wisconsin-Madison, Madison, WI, USA, October 2019.
- [41] D. Zhang, M. Gussev, **S.A. Briggs**, P. Edmondson, Y. Yamamoto, K. Field. "Deformation Mechanisms in a Candidate FeCrAl Alloy and Its Weldment after Neutron Irradiation." Invited presentation at *TMS 2019 Annual Meeting and Exhibition*, San Antonio, TX, March 2019.
- [42] E. Getto, N. Nathan, **S.A. Briggs**, K. Hattar, B. Baker. "Effect of Friction Stir Welding on Microstructure Evolution on In Situ and Ex Situ Self-ion Irradiated MA956." Invited presentation at *TMS 2019 Annual Meeting and Exhibition*, San Antonio, TX, March 2019.
- [43] **S.A. Briggs**, P.-A. Juan, B. Muntifering, H. Yang, M. Knezevic, R. Dingreville, J. Qu, K. Hattar. "Experimental and Modeling Study of Deformation Mechanisms in Irradiated ZIRLO." Invited presentation at *TMS 2019 Annual Meeting and Exhibition*, San Antonio, TX, March 2019.
- [44] **S. A. Briggs**. "Radiation tolerance of FeCrAl alloys for light water reactor fuel cladding applications." Invited presentation at Oregon State University, Corvallis, OR, USA, April 2018.
- [45] **S. A. Briggs**. "Microstructural evolution of FeCrAl alloys in LWR environments." Invited presentation at Los Alamos National Laboratory, Los Alamos, NM, USA, November 2017.
- [46] **S. A. Briggs**, P. D. Edmondson, K. G. Field, Y. Yamamoto, K. C. Littrell, C. R. Daily, K. Sridharan. "Complementary techniques for quantification of α' phase precipitation in neutron-irradiated Fe-Cr-Al model alloys." Invited presentation at *Microscopy & Microanalysis 2016 Meeting*, Columbus, OH, USA, July 2016.

TECHNICAL
PRESENTATIONS

- [47] P. Beck, J. Quincey, D. Mangus, A. Koziol, G.A. Young, G. Mignot, **S.A. Briggs**, J.D. Tucker. *In situ* mechanical testing methods for materials in gaseous environments. Contributed presentation at *Materials in Nuclear Energy Systems 2021*, Pittsburgh, PA, USA, November 2021.

- [48] D. Mangus, S. Walton, G. Mignot, W. Marcum, J.D. Tucker, **S.A. Briggs**. *In situ* materials degradation testing in liquid metal systems. Contributed presentation at *Materials in Nuclear Energy Systems 2021*, Pittsburgh, PA, USA, November 2021.
- [49] X. Quintana, J. Quincey, P. Beck, G.A. Young, J.D. Tucker, **S.A. Briggs**. Fracture mechanics-based testing and DCPD in FLiNaK. Contributed presentation at *Materials in Nuclear Energy Systems 2021*, Pittsburgh, PA, USA, November 2021.
- [50] **S.A. Briggs**, P. Beck, D. Mangus, J. Quincey, A. Brittan, G. Young, G. Mignot, J.D. Tucker. Enabling In-situ Crack Growth Testing and Monitoring in VTR Cartridge Loop Environments. Contributed presentation at *Materials Science & Technology 2020*, Virtual Conference, March 2021.
- [51] **S.A. Briggs**, P. Beck, D. Mangus, J. Quincey, A. Brittan, G. Young, G. Mignot, J.D. Tucker. Enabling In-situ Crack Growth Testing and Monitoring in VTR Cartridge Loop Environments. Contributed presentation at *Materials Science & Technology 2020*, Virtual Conference, November 2020.
- [52] P. Beck, A. Brittan, D. Mangus, J. Quincey, G. Young, G. Mignot, **S.A. Briggs**, J.D. Tucker. In Situ Crack Loading and Measurement Techniques for Gen IV Reactor Coolant Media. Contributed presentation at *Materials Science & Technology 2020*, Virtual Conference, November 2020.
- [53] D. Mangus, P. Beck, S. Walton, G. Mignot, W. Marcum, J.D. Tucker, **S.A. Briggs**. Development of a Combined Thermal Hydraulic and Materials Corrosion Liquid Sodium Experimental Facility. Contributed presentation at *Materials Science & Technology 2020*, Virtual Conference, November 2020.
- [54] J. Quincey, P. Beck, J. Parrington, L. Parrington, C. Lamb, H. Korellis, P. Schulze, A. Kruizenga, M. Hackett, G. Young, J.D. Tucker, **S.A. Briggs**. Development of an In-situ Mechanical Test System for Advanced Reactor Coolants. Contributed presentation at *Materials Science & Technology 2020*, Virtual Conference, November 2020.
- [55] A. Brittan, P. Beck, L. Teeter, **S.A. Briggs**, G. Mignot, S. Teyseyre, J.D. Tucker. Quantifying Environmentally-assisted Cracking In-situ in Ar and s-CO₂ Environments. Contributed presentation at *TMS 2020 Annual Meeting and Exhibition*, San Diego, CA, USA, February 2020.
- [56] A. Brittan, L. Teeter, C. Toledo, **S.A. Briggs**, G. Mignot, S. Teyseyre, J.D. Tucker. In-situ Corrosion Fatigue in Ar and s-CO₂ Environments. Contributed presentation at *Materials Science & Technology 2019*, Portland, OR, USA, October 2019.
- [57] **S.A. Briggs**, A. Monterrosa, C. Taylor, G. Greaves, J. Hinks, K. Hattar. In-situ Observations of Bubble Evolution in Pd during He Implantation at Cryogenic Temperatures in a H₂ Environment. Contributed presentation at *Materials Science & Technology 2019*, Portland, OR, USA, October 2019.

- [58] C. Toledo, L. Teeter, A. Brittan, G. Mignot, J. Tucker, G. Young, **S.A. Briggs**. Techniques for In-situ Monitoring of Materials Degradation in VTR Cartridge Loop Environments. Contributed presentation at *Materials Science & Technology 2019*, Portland, OR, USA, October 2019.
- [59] B.W. Reed, A.A. Moghadam, R.S. Bloom, S.T. Park, A.M. Monterrosa, P.M. Price, C.M. Barr, **S.A. Briggs**, K. Hattar, D.J. Masiel. Electrostatic Subframing and Compressive Sensing Video in in situ Transmission Electron Microscopy. Contributed presentation at the *Microscopy & Microanalysis 2019 Meeting and Exhibition*, Portland, OR, USA, August 2019.
- [60] C. Taylor, J. Sugar, D. Robinson, **S.A. Briggs**, W. York, B. Muntifering, N. Catarineu, K. Hattar. "Advanced In Situ Electron Microscopy Characterization of Hydrogen and Helium Evolution in Materials." Contributed presentation at *TMS 2019 Annual Meeting and Exhibition*, San Antonio, TX, Mar. 2019.
- [61] J. Schuler, C. Barr, **S.A. Briggs**, N. Heckman, K. Hattar, B. Boyce, T. Rupert. "Irradiation and Mechanical Behavior of Nanocrystalline Alloys with Amorphous Intergranular Films." Contributed presentation at *TMS 2019 Annual Meeting and Exhibition*, San Antonio, TX, Mar. 2019.
- [62] **S.A. Briggs**, D. Zhang, K.G. Field, K.C. Littrell, D.T. Hoelzer, S.N. Dryepontd, P.D. Edmondson, K. Hattar. "Microstructural stability of irradiated FeCrAl alloys for fuel cladding applications." Contributed presentation at *2017 MRS Fall Meeting*, Boston, MA, USA, November 2017.
- [63] **S.A. Briggs**, P.M. Price, M. Abere, C.M. Barr, S. Park, B. Reed, D. Masiel, D. Adams, K. Hattar. "Development of and initial results from the first in-situ ion irradiation dynamic TEM." Contributed presentation at *2017 MRS Fall Meeting*, Boston, MA, USA, November 2017.
- [64] **S.A. Briggs**, C.M. Barr, P.M. Price, C.A. Taylor, B.R. Muntifering, D.C. Bufford, K. Hattar. "In-situ ion beam microscopy capabilities at the Sandia Ion Beam Laboratory." Contributed presentation at *2017 MRS Fall Meeting*, Boston, MA, USA, November 2017.
- [65] **S.A. Briggs**, B.E. Klamm, R.F. Hess, K. Hattar. "Synthesis and characterization of d-UO₂ nanoparticles for nuclear fuel microanalysis." Contributed presentation at *2017 MRS Fall Meeting*, Boston, MA, USA, November 2017.
- [66] **S.A. Briggs**, J. Ihlefeld, B. Muntifering, K. Hattar, P. Hosemann. "Nanodispersed Cu-Nb for enhanced radiation tolerance." Contributed presentation at *Materials Science & Technology 2017*, Pittsburgh, PA, USA, October 2017.
- [67] **S.A. Briggs**, P.D. Edmondson, K.G. Field, Y. Yamamoto, K.C. Littrell, C.R. Daily, K. Sridharan. "Quantification of α' precipitation in neutron-irradiated Fe-Cr-Al model alloys utilizing complementary SANS & APT techniques." Contributed presentation at *NuMat 2016*, Montpellier, France, November 2016.
- [68] **S.A. Briggs**, P.D. Edmondson, K.C. Littrell, Y. Yamamoto, K. Sridharan, K.G. Field. "Solute redistribution processes in neutron-irradiated model FeCrAl alloys." Contributed presentation at *TMS 2016 Annual Meeting and Exhibition*, Nashville, TN, USA, February 2016.

POSTER
PRESENTATIONS

- [69] **S.A. Briggs**, J. Pakarinen, L. Barnard, D.D. Morgan, K. Sridharan, J.D. Tucker, T.R. Allen. "Radiation-induced microstructural effects in nickel-chromium binary alloys." Contributed presentation at *TMS 2015 Annual Meeting and Exhibition*, Orlando, FL, USA, March 2015.
- [70] **S.A. Briggs**, J. Pakarinen, L. Barnard, D.D. Morgan, T.R. Allen, K. Sridharan. "Radiation-induced effects in Ni-Cr binary alloys." Contributed presentation at *Materials Science & Technology 2014*, Pittsburgh, PA, USA, October 2014.
- [71] **S.A. Briggs**, P. Beck, D. Mangus, J. Quincey, A. Brittan, G. Young, G. Mignot, J.D. Tucker. In-situ Crack Growth Monitoring in VTR Cartridge Loop Environments. Contributed poster presented at the *Nuclear Materials Conference*, Virtual Conference, October 2020.
- [72] **S.A. Briggs**, A. Monterrosa, N. Heckman, C.M. Barr, T. Clark, L. Treadwell, B. Boyce, K. Hattar. Development of the In-Situ Ion Irradiation SEM at Sandia National Laboratories. Contributed poster presented at the *Microscopy & Microanalysis 2019 Meeting and Exhibition*, Portland, OR, USA, August 2019.
- [73] B.W. Reed, A.M. Monterrosa, A.A. Moghadam, R.S. Bloom, S.T. Park, **S.A. Briggs**, P.M. Price, C.M. Barr, J.T. McKeown, D. Masiel, K. Hattar. Initiation of Grain Growth Observed Using Electrostatic-Subframing. Contributed poster presented at the *Microscopy & Microanalysis 2019 Meeting and Exhibition*, Portland, OR, USA, August 2019.
- [74] **S.A. Briggs**, P.D. Edmondson, K.C. Littrell, Y. Yamamoto, K. Sridharan, K.G. Field. Dependencies of α' embrittlement in neutron-irradiated model Fe-Cr-Al alloys. Contributed poster presented at the Nuclear Fuels and Structural Materials embedded topical meeting at the *2016 ANS Annual Meeting*, New Orleans, LA, USA, June 2016.
- [75] K.G. Field, **S.A. Briggs**, P.D. Edmondson, X. Hu, K.C. Littrell, R. Howard, C.M. Parish, Y. Yamamoto. Radiation tolerance of Fe-Cr-Al alloys: Role of Al & Cr on phase stability under neutron irradiation. Contributed poster presented at the *17th International Conference on Fusion Reactor Materials*, Eurogress Aachen, Germany, October 2015.
- [76] **S.A. Briggs**, J. Pakarinen, L. Barnard, D.D. Morgan, T.R. Allen, K. Sridharan. Study of radiation-induced segregation using nickel-chromium binary alloys. Contributed poster presented at the *TMS 2014 Annual Meeting and Exhibition*, San Diego, CA, USA, February 2014.

GRANTS

Awarded

- [1] Principal Investigator, "Oregon State University Nuclear Science and Engineering Fellowship Program," U.S. Nuclear Regulatory Commission, \$400,000, 2021.
- [2] Principal Investigator, "Fuel liner selection and performance assessment," NuScale Power, LLC, \$336,816, 2020.
- [3] Principal Investigator, "Dose rate effects on irradiation-enhanced precipitation in FeCrAl alloys," DOE, *NSUF-RTE*, Project Number - 19-2889, FIB & APT access, 2019.

- [4] Co-PI, “In-situ mechanical and corrosion testing”, DOE, *INL-18-011*, \$1.48M total in FY2019 - FY2021.
- [5] Principal Investigator, “Study of nanocluster stability in neutron- and ion-irradiated ODS FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 17-954, FIB & TEM access, 2016.
- [6] Principal Investigator, “Parametric study of factors affecting precipitation in model FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 16-687, Atom probe tomography access, 2016.
- [7] Co-PI, “Characterization of precipitation behavior in HFIR irradiated FeCrAl alloys for nuclear applications”, DOE, *NSUF-RTE*, Project Number - IPTS-13692, Accepted 2015, Programmatic proposal for GP-SANS (neutron scattering) facility access, 2015 to 2017.
- [8] Principal Investigator, “Mechanistic determination of dislocation loop formation in irradiated FeCrAl alloys through systematic in situ experimentation”, *ANL IVEM-Tandem*, IVEM user access, 2015.
- [9] Principal Investigator, “Investigation of precipitate formation kinetics and interactions in FeCrAl alloys”, DOE, *NSUF-RTE*, Project Number - 15-556, Atom probe tomography access, 2015.

PROFESSIONAL
EXPERIENCE

Corporate Research Internship **2009 and 2011**

Pacific Northwest National Laboratory, Richland, WA

Supervisor: Dr. Andrew Prichard

Engineering Topics:

- *Design of Passively-Safe Interim Dry Storage Pit for Spent Nuclear Fuel*
- *Reconstruction of Legacy Liquid Metal Fast Reactor Structural Bowing Code for Modern Reactor Design Applications*

Corporate Research Internship **2010**

NuScale Power, Corvallis, OR

Supervisor: Maurice LaFountain

Engineering Topics:

- *Preparation of Scoping Calculations and Process Flow Diagrams for Various Primary and Balance-of-Plant Reactor Systems*

SYNERGISTIC
ACTIVITIES

University Service

- Faculty Supervisor, Oregon State University ANS/HPS Student Chapter, 2019 - Present
- Member, Nuclear Reactor Operations Committee, 2020 - Present
- Member, Nuclear Science & Engineering Curriculum Committee, 2020 - Present
- Member, Nuclear Science & Engineering Faculty Search Committee, 2020 - 2021.
- Member, College of Engineering Public Information Representative Search Committee, 2019 - 2020
- Member, Nuclear Science & Engineering Undergraduate Curriculum Working Group, 2020 - Present

Conference Organizing

- Primary Symposium Organizer - *Advanced Characterization of Materials for Nuclear, Radiation, and Extreme Environments*, MS&T 2020.
- Symposium Co-Organizer - *Accelerated Materials Evaluation for Nuclear Applications Utilizing Irradiation and Integrated Modeling*, TMS 2020.
- Session Chair - *Mechanical Behavior of Nuclear Reactor Components - Defect Evolution I*, TMS 2019.
- Session Chair - *Radiation Effects in Materials for Fission Applications*, CAARI 2018.

Professional Society Membership

- American Nuclear Society
- The Minerals, Metals and Materials Society

Referee Service

- Journal of Nuclear Materials
- Acta Materialia
- Journal of Applied Crystallography
- Journal of Materials Research
- Scripta Materialia
- JOM
- MRS Advances
- Progress in Nuclear Energy

Proposal Review Service

- U.S. DOE SBIR Phase 1 Proposal Technical Reviewer, 2019.
- U.S. DOE NEUP Proposal Technical Reviewer, 2019 - Present
- NSUF RTE Proposal Technical Reviewer, 2019 - Present

HARDWARE AND SOFTWARE SKILLS

Analytical Microscopy & Materials Characterization:

- TEM, STEM, EDS, EELS, PED on FEI and JEOL suite of transmission electron microscopes
- SEM, FIB, EDS, EBSD on FEI and JEOL suite of scanning electron microscopes
- APT on CAMECA suite of local electrode atom probes
- Mechanical/tensile testing
- X-ray, electron, and small-angle neutron diffraction
- Gatan Microscopy Suite
- ImageJ
- CAMECA Integrated Visualization & Analysis Software (IVAS)
- The Stopping and Range of Ions in Matter (SRIM)

Numerical Analysis:

- MATLAB, Mathematica

Desktop Editing and Productivity Software:

- \TeX (\LaTeX , \BIBTeX),
- Microsoft Office, OpenOffice, OriginPro, Google Docs
- Adobe Creative Cloud, GIMP

Operating Systems:

- Microsoft Windows family, Apple macOS, Linux, Unix, Android, Apple iOS

AWARDS, HONORS,
AND RECOGNITION

- Microscopy & Microanalysis Meeting Scholar Award Recipient, 2016
- Nuclear Fuels & Structural Materials Meeting Student Poster Award, 2016
- Nuclear Energy University Program Fellow, 2012-2015