Dunji Yu Ph.D.

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RESEARCH INTERESTS & SKILL SETS

- Application of neutron diffraction for phase transformation, phase-specific load sharing, residual stress of engineering materials under mechanical loads, e.g. austenitic stainless steels, shape memory alloys, nano-layered composites
- Design of sample environment for in-situ neutron scattering of metallic, ceramic and polymer materials under mechanical and/or thermal loading conditions
- Finite element analysis of engineering problems for structural integrity assessment of process equipment, e.g. welding and sealing of nuclear reactor pressure vessel
- Mechanical testing and constitutive modeling of monotonic and cyclic deformation of materials, e.g. uniaxial tension, creep, fatigue and ratcheting of stainless steels

PROFESSIONAL EXPERIENCE

Oak Ridge National Laboratory (ORNL)
- 2020.09-present Scientific Associate, Neutron Scattering Division

Center for Reliable Energy Systems (CRES)
- 2018.10-2020.08 Senior Research Engineer

The University of Tennessee – Oak Ridge National Laboratory (UTK-ORNL)
- 2017.06-2018.09 Post-doctoral Research Associate, Shull Wollan Center

Tianjin University, China (TJU)
- 2015.07-2017.05 Lecturer, Department of Chemical Process Machinery

Oak Ridge National Laboratory (ORNL)
- 2012.09-2014.08 Visiting Student, Spallation Neutron Source (SNS)

EDUCATION

- 2011.09-2015.01 Ph.D. Chemical Process Machinery, Tianjin University, China
- 2008.09-2010.06 M.S. Chemical Process Machinery, Tianjin University, China
- 2004.09-2008.06 B.S. Process Equipment and Control Engineering, Tianjin University, China

SELECTED HONORS & AWARDS

- 2022.11 Best Experiment Finalist, Neutron Scattering Division Awards Night, ORNL
- 2020.12 Best Experiment Finalist, Neutron Scattering Division Awards Night, ORNL
- 2016.11 Excellent Ph.D. Dissertation by Chinese Society of Mechanical Engineers
- 2012.06 Academic Horizon Award from Ministry of Education, China
- 2008.08 Experiment Award in Bayer Cup-APCChE "Chem-E-Car" Competition (12th Asian Pacific Confederation of Chemical Engineering Congress, Dalian, China)

JOURNAL PUBLICATIONS (*Corresponding Author)

[1] D. Zhang, Y. Chen, H. Vega, T. Feng, **D. Yu**, M. Everett, J. Neuefeind, K. An, R. Chen, J. Luo*, *Long-and short-range orders in 10-component compositionally complex ceramics*, Advanced Powder Materials, 2023, 2 (2):100098. https://doi.org/10.1016/j.apmate.2022.100098

[2] R.A. Michi, S. Bahl, C. M. Fancher, K. Sisco, L. F Allard, K. An, **D. Yu**, R. R. Dehoff, A. Plotkowski, A. Shyam*, Load shuffling during creep deformation of an additively manufactured AlCuMnZr alloy, Acta Materialia 2023, 244: 118557. https://doi.org/10.1016/j.actamat.2022.118557

[3] W. Tang*, C. M. Fancher, P. Nandwana, K. An, A. Nycz, H. Wang, R. Kannan, A. Trofimov, **D. Yu**, D. N. Leonard, L. Meyer, A. Plotkowski*, *Temperature-dependent thermal and mechanical properties of a wire arc additively manufactured low transformation temperature steel*, Metallurgical and Materials Transactions A, 2022, https://doi.org/10.1007/s11661-022-06933-6

[4] S. Huang*, C. Shen, K. An, Y. Zhang, I. Spinelli, M. Brennan, **D. Yu**, *Residual stress and microstructure in IN718-René41 graded superalloy fabricated by laser blown directed energy deposition*, Frontiers in Metals and Alloys, 2022, https://doi.org/10.3389/ftmal.2022.1070562

[5] D. Zhang, Y. Chen, T. Feng, **D. Yu**, K. An, R. Chen, J. Luo*, *Discovery of a reversible redox-induced order-disorder transition in a 10-component compositionally complex ceramic*, Scripta Materialia 2022, 215: 114699. https://doi.org/10.1016/j.scriptamat.2022.114699

[6] R. Feng, G. Kim, **D. Yu**, Y. Chen, W. Chen, P.K. Liaw, K. An*, *Elastic behavior of binary and ternary refractory multi-principal-element alloys*, Materials & Design, 2022, 219: 110820. https://doi.org/10.1016/j.matdes.2022.110820

[7] S. Huang*, E. Dolley, K. An, **D. Yu**, C. Crawford, M. A. Othon, I. Spinelli, M. P. Knussman, R. B. Rebak, *Microstructure and tensile behavior of powder metallurgy FeCrAl accident tolerant fuel cladding*, Journal of Nuclear Materials, 2022, 560: 153524. https://doi.org/10.1016/j.jnucmat.2022.153524

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[9] S. Fu, **D. Yu**, Y. Chen, T. Zou, Z. Gai, X. Chen, K. An*, *Magnetic ordering suppressed phase transformation of a TRIP-HEA during thermal cycling*, Applied Physics Letters, 2021, 119(17): 171906. https://doi.org/10.1063/5.0064847

[10] R. Feng, Y. Rao, C. Liu, X. Xie, **D. Yu**, Y. Chen, M. Ghazisaeidi, T. Ungar, H. Wang, K. An*, P. Liaw*, *Enhancing fatigue life by ductile-transformable multicomponent B2 precipitates in a high-entropy alloy*, Nature Communications, 2021, 12(1): 1-10. https://doi.org/10.1038/s41467-021-23689-6

[11] C. Guo, **D. Yu***, X. Sun, W. Yu, X. Chen*, *Fatigue failure mechanism and life prediction of a cast duplex stainless steel after thermal aging*, International Journal of Fatigue, 2021, 146: 106161. https://doi.org/10.1016/j.ijfatigue.2021.106161

[12] S. Fu, **D. Yu***, Y. Chen, K. An, X. Chen*, *Size effect in stainless steel thin wires under tension*, Materials Science and Engineering: A, 2020, 139686. https://doi.org/10.1016/j.msea.2020.139686

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diffraction measurements, Metallurgical and Materials Transactions A, 2020, 51(10): 5029-5035.
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Wang kinematic hardening rule for uniaxial ratcheting behavior of Z2CND18.12N steel, International Journal of Plasticity, 2012, 28(1): 88-101. https://doi.org/10.1016/j.ijplas.2011.06.001

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CONFERENCE

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[4] **D. Yu**, H. Bei, Y. Chen, K. An, X. Chen, *Exploring thermo-mechanical deformation mechanism of a NiAl-Cr(Mo) superalloy by in-situ neutron diffraction*, TMS 144th ANNUAL MEETING & EXHIBITION, March 12-15, 2018, Phoenix, Arizona, USA. (Poster)

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[6] **D. Yu**, H. Bei, Y. Chen, K. An, *The role of phase-specific deformation behavior in the compressive toughness enhancement of a NiAl-Cr(Mo) lamellar composite*, American Conference on Neutron Scattering, June 1-5, 2014, Knoxville, Tennessee, USA. (Poster)

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