

Exponent®
Engineering & Scientific Consulting

Keli Thurston, Ph.D., P.E.

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Professional Profile

Dr. Thurston specializes in characterization of engineering systems and their modes of failure from fractographic analyses of individual defective units to extent of condition analyses across multifaceted utility networks. Dr. Thurston has experience with a broad range of material families including metals, polymer photovoltaics, glasses, ceramics, and composites with clients from industries including energy, automotive, personal electronics, and academic collaborators. In addition to classic failure analysis investigations, she has extensive experience working with utility sector clients on asset health, management, and maintenance strategies with a focus towards risk management and mitigation.

In the laboratory, Dr. Thurston is experienced in the design and implementation of mechanical testing and post-testing analyses on a range of materials including metals, glasses, composites, and polymers. Dr. Thurston has significant experience with a versatile array of fractographic and spectroscopic analysis techniques including scanning electron microscopy (SEM), fluorescence confocal microscopy, electron backscatter diffraction (EBSD), grazing incidence x-ray diffraction (GIXD), x-ray diffraction (XRD), and Fourier-transform infrared spectroscopy (FTIR).

Prior to joining Exponent, Dr. Thurston studied the mechanical and microstructural properties of unusual metallic alloy systems such as bulk metallic glasses and 'high-entropy' alloys with a particular focus on their fatigue and fracture behavior under extreme temperature conditions. She is well-versed in the development and execution of mechanical testing procedures with a variety of test-specimen geometries and has extensive practice working with servo-hydraulic load frames. Her Ph.D. thesis examined the temperature dependence of the crack-propagation behavior in the 'high-entropy' alloy CrMnFeCoNi under high-cycle fatigue with a focus on the impact of cryogenic conditions.

In addition to her academic and professional work, Dr. Thurston has extensive experience working hands-on with a wide array of materials in a variety of positions such as a laboratory teaching assistant, ceramics studio intern, and stained glass studio instructor. This varied background ensures she can relate complex ideas in a way that is both accessible and engaging.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of California, Berkeley, 2018

M.S., Materials Science and Engineering, University of California, Berkeley, 2016

B.S., Materials Science and Engineering, Cornell University, 2013

Recipient, NSF Graduate Research Fellowship, 2013

Member, Tau Beta Pi engineering honors society

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Licenses and Certifications

Professional Engineer Metallurgical, California, #2038

Professional Affiliations

ASTM International, American Society of Metals (member)

IEEE, Institute of Electrical and Electronics Engineers (member)

TMS, The Minerals, Metals & Materials Society (member)

Tau Beta Pi (member)

Publications

Thurston KVS, Gludovatz B, Yu Q, Laplanche G, George EP, Ritchie RO. Temperature and load-ratio dependent fatigue-crack growth in the CrMnFeCoNi high-entropy alloy. Journal Alloy and Compounds 2019; 794:523-533.

Thurston KVS, Hohenwarter A, Laplanche G, George EP, Gludovatz B, Ritchie RO. On the onset of deformation twinning in the CrMnFeCoNi high-entropy alloy using a novel tensile specimen geometry. Intermetallics 2019; 110:106469.

Thurston KVS, Gludovatz B, Hohenwarter A, Laplanche G, George EP, Ritchie RO. Effect of temperature on the fatigue-crack growth behavior of the high-entropy alloy CrMnFeCoNi. Intermetallics 2017; 88:65-72.

Gludovatz B, Granata D, Thurston KVS, Loffler J, Ritchie RO. On the understanding of sample size on the variability of fracture toughness of bulk metallic glasses. Acta Materialia 2017; 126:494-506.

Gludovatz B, Hohenwarter A, Thurston KVS, Bei H, Wu Z, George EP, Ritchie RO. Exceptional damage-tolerance of a medium-entropy alloy CrCoNi at cryogenic temperatures. Nature Communications 2016; 7:10602.

Presentations

Davis CF, Thurston KVS, Dunne R, Didyk M, Simhadri A. Correlation of Adverse Seasonal Weather Effects with Asset Failure Rates. Symposium presentation, CEATI Transmission & Distribution Conference, Palm Springs, CA, 2024.

Thurston KVS, Gludovatz B, George EP, Ritchie RO. On the temperature dependence of fatigue-crack propagation in the CrMnFeCoNi high-entropy alloy. Symposium presentation, 147th TMS Annual Meeting & Exhibition, Phoenix, AZ, 2018.

Thurston KVS, Gludovatz B, George EP, Ritchie RO. Temperature dependent fatigue and failure in high-entropy Cantor alloy CrMnFeCoNi. Symposium presentation, MRS Fall Meeting & Exhibit, Boston, MA, 2017.

Thurston KVS, Gludovatz B, Laplanche G, George EP, Ritchie RO. The effect of temperature on fracture and fatigue in the high-entropy alloy CrMnFeCoNi. Poster presentation, 146th TMS Annual Meeting & Exhibition, San Diego, CA, 2017.