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TMS 2018
147th Annual Meeting & Exhibition



MARCH 11 – 15, 2018
PHOENIX, ARIZONA

SUBMIT AN ABSTRACT TO:

MECHANICS AND STRUCTURAL RELIABILITY

**FRACTURE: 65 YEARS AFTER THE WEIBULL DISTRIBUTION
AND THE WILLIAMS SINGULARITY**

In 1951, Waloddi Weibull published a single-author paper describing a new statistical distribution “of wide applicability” in the *Journal of Applied Mechanics*. The very next year in the same journal, Max Williams published a single-author paper describing an analytic stress singularity that has become the foundation of linear elastic fracture mechanics. The Weibull distribution provides a stress-based method for assessing the statistics of failure whereas the Williams singularity provides a deterministic description of the stress field at a crack tip that drives fracture. While the two approaches are quite different, they both continue to be profoundly useful for engineering design.

This symposium will focus on application of these methods to materials science, the limitations of these methods, and nuance that has been unearthed after 65 years of use. How have these methods assisted in the development of improved engineering materials and more reliable engineered structures? What recent analysis methods for material failure might have a similar impact 65 years from now? Why is recent research not as readily adopted by broad engineering practice? What are the current generational challenges in fracture and material failure?

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