



UAA Professional Development Seminar Series

## Corrosion of 3D Printed 316L Stainless Steel



Presented by: Dr. Peter Renner, Material Scientist, Pacific Northwest  
National Laboratory

**ABSTRACT:** Additive manufacturing of metals enables the rapid fabrication of components with complex geometries that do not require subsequent machining or finishing. However, the 3D printing process introduces unique material properties which must be understood before a component is utilized. In this research, 316L stainless steel was fabricated by a type of 3D printing known as laser powder bed fusion (LPBF). The LPBF process creates tortuous surfaces which can be detrimental to corrosion performance, especially in marine environments. This presentation details several types of corrosion experiments and analysis techniques to quantify the unique corrosion mechanisms and corrosion resistance of LPBF 316L stainless steel.

**BIO:** Dr. Peter Renner is an early career materials scientist at Pacific Northwest National Laboratory (PNNL). His work encompasses several topics including metal additive manufacturing, thermoelectric materials, and nuclear engineering. He received his B.S. in mechanical engineering from the University of Alaska Anchorage, where he was a founding member of the UAA Robotics Club. He subsequently completed a Ph.D. in mechanical engineering at Texas A&M University under Dr. Hong Liang, where he developed and characterized multiple new coating fabrication techniques. Prior to joining PNNL, Dr. Renner also completed a postdoctoral appointment at Sandia National Laboratories, where he studied the process-property-structure relationship of additively manufactured alloys.

Dr. Renner's work has been recognized in several ways, including 400+ citations from over 30 peer-reviewed journal articles. He is the recipient of the Texas A&M University Association of Former Students Distinguished Graduate Student Award for Excellence in Research (2023), DARPA Forward Riser award (2022), J. Mike Walker '66 Impact Award (2021), Byron Anderson '54 Fellowship (2021), Independent Lubricant Manufacturer's Association Bob Jackson Award (2019), and National Science Foundation Graduate Research Fellowship (2018).

Friday, March 29, 2024  
11:45 am - 12:45 pm  
EIB 211 or Online Via [YouTube Live](#)