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Quentin Rizzardi, Ph.D., M.Sc.

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Professional Profile

Dr. Rizzardi specializes in materials science and metallurgy with particular expertise in the deformation and failure mechanisms of metals, such as high-entropy alloys and Al-Cu alloys, among others. Prior to joining Exponent, Dr. Rizzardi completed his Ph.D. in Materials Science & Engineering at the University of Illinois Urbana-Champaign. His thesis established core concepts regarding the relationships between microstructure, temperature, mechanical loading, and dislocation activity, all of which serve to deepen our understanding of the fundamental deformation processes in metals and their impact on material strength and service life. Beyond experimental techniques, his research specialized in signal processing and advanced statistical analysis and data science techniques.

Dr. Rizzardi previously was a Materials Science team leader for Brunswick Corporation, where he and his team implemented computational tools to predict the microstructure upon solidification of a steel alloy. Their work influenced the casting processes for the next generation of boat propellers. Dr. Rizzardi also previously worked in Johnson Matthey's Noble Metals division. In this role, he provided technical expertise to clients implementing new technological processes, such as platinum coating of ceramics used in glass manufacturing.

Dr. Rizzardi has expertise over a wide range of characterization techniques, including scanning electron microscopy (SEM), transmission electron microscopy (TEM), focused ion beam milling (FIB), as well as ex-situ and in-situ micro- and nanoindentation techniques.

As a native French speaker, Dr. Rizzardi is also involved with various volunteering efforts to assist French-speaking students and newcomers in their integration into American society.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Illinois at Urbana-Champaign, 2022

B.Eng., Mechanical Engineering, University of Lorraine (UL), France, 2014

M.Sc., Advanced Metallurgy, University of Lorraine (UL), France, 2014

Best Graduate Research Award, University of Illinois Urbana-Champaign, 2022

Licenses and Certifications

Professional Engineer Mechanical, California, #43105

Prior Experience

Materials Science Team Leader, Brunswick I-Jet Lab, 2021

Sales Coordinator, Johnson Matthey, 2014-2017

Languages

French (France)

German

Publications

Rizzardi Q, Derlet PM, Maaß R. Intermittent plasticity in the presence of a complex microstructure. Physical Review Materials 2022; 6(7): 073602.

Rizzardi Q, McElfresh C, Sparks G, Stauffer DD, Marian J, Maaß R. Mild-to-wild plastic transition is governed by athermal screw dislocation slip in bcc Nb. Nature Communications 2022; 13:1010.

Rizzardi Q, Derlet PM, Maaß R. Microstructural signatures of dislocation avalanches in a high-entropy alloy. Physical Review Materials 2021; 5(4):043604

Rizzardi Q, Sparks G, Maaß R. Fast slip velocity in a high-entropy alloy. Journal of Metals 2018; 70(7):1088-1093

Sparks G, Cui Y, Po G, Rizzardi Q, Marian J, Maaß R. Avalanche statistics and the intermittent to-smooth transition in microplasticity. Physical Review Materials 2019; 3(8):0806

Shimanek J, Rizzardi Q, Sparks G, Derlet PM, Maaß R. Scale-dependent pop-ins in nanoindentation and scale-free plastic fluctuations in microcompression. Journal of Materials Research 2019; 35(2):196-205

Honrao SJ, Rizzardi Q, Maaß R, Trinkle DR, Hennig RG. Split-vacancy defect complexes of oxygen in hcp and fcc cobalt. Physical Review Materials 2020; 4(10):103608

Presentations

Rizzardi Q, Derlet PM, Maaß R, Microstructural signatures of dislocation avalanches in a high entropy alloy, Materials Research Society 2021

Rizzardi Q, Derlet PM, Maaß R, Microstructural signatures of dislocation avalanches in a high entropy alloy, The Minerals, Metals & Materials Society 2021