

Paul F. Rottmann, PhD

PROFESSIONAL PREPARATION

University of Kentucky	Materials Science & Engineering	B.S. 2010
Johns Hopkins University	Materials Science & Engineering	M.S. 2012
Johns Hopkins University	Materials Science & Engineering	Ph.D. 2017
University of California, Santa Barbara	Postdoc focus: Materials Characterization	2017-2019

APPOINTMENTS

University of Kentucky	Assistant Professor	2019-current
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RESEARCH INTERESTS

The aim of my research is to connect the macroscopic properties of materials to the underlying nanoscale mechanisms that govern their behavior through the use of advanced characterization techniques. Currently, Two areas of particular interest are developing methods to map the complex processing – microstructure – properties relationships for additively manufactured metals as well as developing novel thin film alloys for high temperature applications.

PUBLICATIONS

Five closely related publications:

1. **P.F. Rottmann**, K.J. Hemker. Nanoscale elastic strain mapping of polycrystalline materials, *Materials Research Letters* 6 (2018) 249-254.
2. **P.F. Rottmann**, K.J. Hemker. Experimental observations of twin formation during thermal annealing of nanocrystalline copper films using orientation mapping, *Scripta Materialia* 141 (2017) 76-79.
3. **P.F. Rottmann**, K.J. Hemker. Experimental quantification of mechanically induced boundary migration in nanocrystalline copper films, *Acta Materialia* 140 (2017) 46-55.
4. **P.F. Rottmann**, K.J. Hemker, In Situ Analysis of the Fracture Behavior of Nanocrystalline Copper Using Precession-Assisted Crystal Orientation Mapping. *Microscopy and Microanalysis*. 21(S3). 273–274.
5. P.W. Trimby, Y. Cao, Z. Chen, S. Han, K.J. Hemker, J. Lian, X. Liao, **P. Rottmann**, S. Samudrala, J. Sun, J.T. Wang, J. Wheeler, J.M. Cairney. Characterizing deformed ultrafine-grained and nanocrystalline materials using transmission Kikuchi diffraction in a scanning electron microscope, *Acta Materialia* 62 (2014) 69-80.

Five other significant publications:

6. L. Ma, **P.F. Rottmann**, K. Xie, K.J. Hemker. Nano-scale Elastic Strain Maps of Twins in Magnesium Alloys, *Microscopy and Microanalysis* 24 (2018) 970-971.
7. M.A. Kumar, B. Leu, **P.F. Rottmann**, L. Ma, I.J. Beyerlein. Characterization of staggered twin formation in HCP magnesium. Accepted for publication as a book chapter in *Magnesium Technology* 2019.

8. D. Raciti, L. Cao, K.J.T. Livi, **P.F. Rottmann**, X. Tang, C. Li, Z. Hicks, K.H. Bowen, K.J. Hemker, T. Mueller, C. Wang. Low-Overpotential Electroreduction of Carbon Monoxide Using Copper Nanowires, *ACS Catalysis* 7 (2017) 4467-4472.
9. L. Cao, D. Raciti, C. Li, K.J.T. Livi, **P.F. Rottmann**, K.J. Hemker, T. Mueller, C. Wang. Mechanistic Insights for Low-Overpotential Electroreduction of CO₂ to CO on Copper Nanowires, *ACS Catalysis* 7 (2017) 8578-8587.
10. J. Liu, **P. Rottmann**, S. Dutta, P. Kumar, R. Raj, M. Renavikar, I. Dutta. Next Generation Materials for Thermal Interface and High Density Energy Storage Applications via Liquid Phase Sintering. 2009 pp 506-511.