William G. Fahrenholtz

Professor of Ceramic Engineering
Missouri University of Science and Technology

Academic Experience

Ph.D. Chemical Engineering, University of New Mexico, December 1992
Dissertation: *Particle Size and Mixing Effects on the Crystallization and Densification of Sol-Gel Mullite*
Advisor: Dr. Douglas M. Smith

M.S. Ceramic Engineering, University of Illinois at Urbana-Champaign, May 1989
Thesis: *Preparation of $YBa_2Cu_3O_{7-\delta}$ from Homogeneous Metal-Alkoxide Solution*
Advisor: Dr. David A. Payne

B.S. Ceramic Engineering, University of Illinois at Urbana-Champaign, May 1987
Graduated with Highest Honors, GPA 4.85/5.0

Research and Professional Experience

2008 to present — Professor of Ceramic Engineering
Senior Investigator, Graduate Center for Materials Research
Missouri S & T (formerly University of Missouri-Rolla)

1999 to 2008 — Assistant/associate professor of Ceramic Engineering and Research Investigator in the Graduate Center for Materials Research at Missouri S&T

Present research areas include processing and characterization of ultra-high temperature ceramics (UHTCs) and cerium oxide coatings for corrosion protection of aluminum alloys. Notable recent research accomplishments for the UHTC and Ce research groups include:

- Co-authored a "Feature Article" for J. Am. Ceram. Soc., ("Refractory Diborides of Zirconium and Hafnium) published in May 2007.
- Devised pressureless sintering processes for ZrB2 ("Pressureless Densification of Zirconium Diboride with Boron Carbide Additions," J. Am. Ceram. Soc., 89(5) 1544-1550 (2006))
- Investigated the corrosion protection mechanisms of cerium oxide conversion coatings ("Effect of Gelatin Additions on the Corrosion Resistance of Cerium Based Conversion Coatings Spray Deposited on Al 2024-T3," published in Surf. and Coatings Tech. in 2009).
- Investigated reaction-based processes for the densification of ultra-high temperature cermets ("Reactive Sintering of ZrC/W Composites and Method for Producing the Same," U.S. Patent 7,648,675, Issued January 19, 2010
- Developed or co-developed five new courses at Missouri S&T. Most recently, MSE 422 – Thermodynamics and Phase Equilibria, which is part of the core curriculum for PhD students in the department. The course was first taught in Fall 2005.
- Worked with Worldwide Youth in Science and Engineering to introduce 'Academic Challenge' (high school math and science competition) in Missouri. Built from nothing to ~450 participants in 5 years with regional, sectional, and state final competitions.

1993 to 1999 — Research assistant professor of Chemical Engineering, University of New Mexico
Researched ceramic-metal reactions and composite formation by reactive hot pressing and reactive metal penetration. Examined processing methodologies, characterized microstructures, studied reaction sequences, and evaluated mechanical properties.

Honors and Awards

2012 Academy of Mines and Metallurgy Senior Faculty Award, 2012

2010 Missouri S&T Faculty Service and Faculty Research Awards

2009 Missouri S&T Faculty Excellence Award
Elected to the Board of Directors of the American Ceramic Society

2008 Missouri S&T Faculty Excellence Award

2007 Fellow of the American Ceramic Society
UMR Faculty Excellence Award

2006 Univ. of New Mexico School of Engineering Young Distinguished Engineer Award
UMR Faculty Excellence Award

2005 MSM/UMR Alumni Association Outstanding Student Advisor Award
UMR Ceramic Engineering "Outstanding Faculty Member"

2004 NSF CAREER Award: Reactive Processing of High Temperature Materials
UMR Faculty Excellence Award

2003 UMR Outstanding Teaching Award
MSM/UMR Alumni Association Class of 1942 Outstanding Teaching Award
UMR Faculty Excellence Award

Professional Societies and Service

American Ceramic Society (Fellow since 2007)	Member since 1986
Board of Directors (2009-2012)	
Publications Committee (Chair 2008-2009, member 2005-2009)	
Education Integration Committee (Chair 2005-2006 and 2006-2007)	
Ceramic Educational Council (President 2004-2005, other positions 2001-2004)	
New Mexico Section (chair 1996, Vice-Chair 1994, and Treasurer 1995)	
National Academies Committees	
Needs/R&D Strategy for Future Military Aerospace Propulsion	2009
Testing of Body Armor for the U.S. Army Phase II	2010
Testing of Body Armor for the U.S. Army Phase III	2010
Member of Associate Editorial Board for *Materials Letters*	Since February 2006
National Institute of Ceramic Engineers	Member since 1992
Keramos (Ceramic Engineering Professional Fraternity)	Elected 1985
Tau Beta Pi	Elected 1986
American Society for Engineering Education	Member since 2000
Sigma Xi	Member since 2004
Alpha Sigma Mu	Member since 2005

Publications and Presentations

Lead author or co-author on more than 95 manuscripts published in peer-reviewed journals
Presenter or co-author on more than 200 presentations at international technical conferences

Research Support

PI or co-PI on grants including current research funded by the National Science Foundation (DMR 0906584) and the Air Force Office of Scientific Research (FA9550-09-1-0168) as well as other government agencies and companies.