

MARTIN PAUL HARMER

Professor and Alcoa Foundation Professor
Materials Science and Engineering
Lehigh University
Email: *mph2@lehigh.edu*

a. Professional Preparation

Leeds University, England	Ceramic Science	B.Sc. (1st class honors)	1976
Leeds University, England	Ceramic Science	Ph.D.	1980
Univ. of California, Berkeley		(one year)	1978
Leeds University, England	Ceramics	D.Sc.	1995

b. Appointments

Director, Center for Advanced Materials and Nanotechnology, Lehigh University, 2003 - present
Director, Materials Research Center (MRC), Lehigh University, 1992 – 2003
Full Professor, Materials Science and Engineering, Lehigh University, 1988- present
Director of the Ceramics Research Laboratory, MRC, Lehigh University, 1988-1992
Associate Professor, Materials Science and Engineering, Lehigh University, 1984-1988
Assistant Professor, Materials Science and Engineering, Lehigh University, 1980-1984

c. Publications (250 total)

(i) Publications most closely related to the proposed project (up to 5)

Martin P. Harmer, “Interfacial Kinetic Engineering: How Far Have We Come Since Kingery’s Inaugural Sosman Address?”, *J. Am. Ceram. Soc.*, 93 [2], 301-317 (2010)

Shen J. Dillon, Martin P. Harmer and Gregory S. Rohrer, “The Relative Energies of Normally and Abnormally Growing Grain Boundaries in Alumina Displaying Different Complexions”, *J. Am. Ceram. Soc.*, 93 [6], 1796-1802 (2010)

S. J. Dillon, M. P. Harmer and G. S. Rohrer, “Influence of Interface Energies on Solute Partitioning Mechanisms in Doped Aluminas”, *Acta Materialia*, 58 5097-5108 (2010)

Shen J. Dillon, Ming Tang, W. Craig Carter and Martin P. Harmer, “Complexion: A New Concept for Kinetic Engineering in Materials Science,” *Acta Materialia*, 55, 6208-6218 (2007)

Shen J. Dillon and Martin P. Harmer, “Multiple Grain Boundary Transitions in Ceramics: A Case Study of Alumina,” *Acta Materialia*, 55[15], 5247-5254 (2007).

(ii) Other significant publications (up to 5)

S. J. Dillon, M. P. Harmer, and J. Luo, “Grain Boundary Complexions in Ceramics and Metals: An Overview” (**invited**), *JOM*, 61 [12], 38-44 (December 2009).

S. J. Dillon, H. Miller, M. P. Harmer, and G. S. Rohrer, “Grain Boundary Plane Distributions in Aluminas Evolving by Normal and Abnormal Grain Growth and /displaying Different Complexions”, *International Journal of Materials Research*, 101, 50-56 (2010)

M. Baurer, S. J. Shih, C. Bishop, M. P. Harmer, D. Cockayne and M. Hoffmann, "Abnormal Grain Growth in Undoped Strontium and Barium Titanate", *Acta Materialia*, 58 [1], 290-300 (2010)

Shen Dillon and Martin Harmer, "Demystifying the Role of Sintering Additives with Complexion," *J. Eur. Ceram. Soc.*, 28[7], 1485-1495 (2008)

J. Cho, C.M. Wang, H.M. Chan, J.M. Rickman, and M.P. Harmer, "Role of Segregating Dopants on the Improved Creep Resistance of Aluminum Oxide," *Acta Materialia*, 47[15], 4197-4207 (1999).

d. Professional Activities and Recognition

National and International Awards

- 2010 W. David Kingery Lifetime Achievement Award, American Ceramic Society, in recognition of using systematic experiments to resolve longstanding questions in ceramic science
- 2008 Robert B. Sosman Memorial Award, Highest Honor for Basic Science Achievement, American Ceramic Society. A Symposium on Kinetic Engineering of Interfacial Transport Processes was organized in honor of the awardee
- 2007 Member, World Academy of Ceramics
- 2006 Humboldt Award for Senior Scientists, Alexander von Humboldt Foundation
- 2002 Member, European Academy of Sciences
- 2002 ISI Most Highly Cited Researcher
- 1998 G. C. Kuczynski Prize, International Institute for the Science of Sintering
- 1998 Ross Coffin Purdy Award for Best Paper, American Ceramic Society
- 1998 Richard M. Fulrath Award, American Ceramic Society
- 1996 Creativity Award, National Science Foundation
- 1995 Doctor of Science, Leeds University, England
- 1993 Fellow, American Ceramic Society
- 1992, 1986 Rowland B. Snow Award, American Ceramic Society
- 1989 Member, International Institute for the Science of Sintering
- 1989 DuPont Faculty Award
- 1985 Alcoa Foundation Award
- 1984-2010 International Ceramographic Contest Winners (~60 total)
- 1984 NSF Presidential Young Investigator Award, The White House, Ronald Reagan.
- 1984 IBM Faculty Development Award.

Other Awards

- 1990 Eleanor and Joseph F. Libsch Research Award, Lehigh University
- 1999, 2005, 2006 Gilbert E. Doan '19 Award to the Professor who "has best served them as mentor, in the Technical, Civic, Moral, and Spiritual dimensions of their education".
- 2003 Engineering Ingenuity Award, College of Engineering, Lehigh University
- 2004 Hillman Faculty Award, Lehigh University
- 2006 Teaching Excellence Award, College of Engineering, Lehigh University
- 2007 Ben Franklin Technology Partners Innovation Award

e. Major Professional Activities

2007-present, Editor, Acta Materialia
2006, 2009 Co-Chair (with Manfred Rühle), International Conference on Interfaces in Functional Materials, Bear Creek PA
2000-present, Director, Pennsylvania Materials Research Science and Engineering Center
2004-present Fulrath Award Committee, American Ceramic Society
2001-02, Nominating Committee, American Ceramic Society
1998 Committee on Advanced Fibers for High-Temperature Ceramic Composites, National Materials Advisory Board Commission on Engineering and Technical Systems, National Research Council
1986 Chair, International Symposium on the Applications of Ferroelectrics
1984-2007 Associate Editor, American Ceramic Society
1994 Chair, Basic Science Division, American Ceramic Society
1993 Program Chair, Basic Science Division, American Ceramic Society
1991 Chair, Gordon Research Conference on Ceramics

f. Synergistic Activities

- Co-founder and organizer (with Professor Manfred Rühle) of an International Conference Series on Interface Science. First conference held October 10-14, 2006 at Bear Creek, Macungie, PA. Second conference on the topic of “Complexions” held on October 19-24, 2009.
- Humboldt senior research scientist award involving collaboration with the University of Darmstadt, Karlsruhe University, and The Max Planck Institute in interface science research.
- Plenary lectures on complexion and interface kinetic engineering for the Materials Research Society, Brazil, October 2007 and for the Sosman Memorial Award, American Ceramics Society, October 2008.
- Founder and Chair of the Materials Pennsylvania Coalition (MatPAC). The MatPAC promotes cross-university sharing of graduate education and sharing of research facilities among six research universities in Pennsylvania.
- Co-P.I. of the NSF CMU Materials Research Science and Engineering Center (MRSEC), and P.I. of the Commonwealth of PA LU/CMU MRSEC.

e. Collaborators & Other Affiliations:

Hugo Caram (Lehigh University); G. Slade Cargill, III (Lehigh University); W. Craig Carter (MIT); Helen Chan (Lehigh University); Arthur Heuer (Case Western Reserve); Christopher Kiely (Lehigh University); E. R. Leite (Brazil); Jeffrey Rickman (Lehigh University); Gregory Rohrer (Carnegie Mellon); Manfred Rühle (Germany); Winston Soboyejo (Princeton University); George C. Wei (Osram Sylvania);

f. Graduate and Postdoctoral Advisors:

Richard Brook, Executive Director, Leverhulme Foundation, United Kingdom.