

Biographical Sketch of Principal Investigator: Tongguang Zhai

a. Professional Preparation.

- 8/1/2000-8/14/2001 **Postdoctoral Research Associate**
University of Kentucky conducting research work on continuous cast Al
- 1/21/1995-4/30/2000 **Research Fellow**
University of Oxford, England studying short fatigue crack initiation & propagation
- 10/1/1994-12/31/1994 **Postdoctoral Assistant**
Fraunhofer Institute for NDT, Germany ultrasonic NDT and acoustic microscopy of materials
- 9/1991-9/1994 **Ph.D. student** D.Phil (Ph.D), 9/1996
Materials Science, University of Oxford, England
- 9/1979-6/1983 **Undergraduate** B.Sc., 6/1983
Materials Physics, University of Science & Technology Beijing, China

b. Appointments.

- 7/2007—present **Associate Professor**, Department of Chemical and Materials Engineering
University of Kentucky, Lexington, KY 40506-0046, USA
- 8/2001—6/2007 **Assistant Professor**, Department of Chemical and Materials Engineering
University of Kentucky, Lexington, KY 40506-0046, USA
- 9/1983—8/1986 **Research Engineer**, Welding Department
Institute of Building and Construction Research, Beijing, China

c. Publications (selected from 54 peer reviewed papers).

- 1) Y.B. Zhang, J.H. Xu, T. **Zhai**, Distributions of Pore Size and Fatigue Weak Link Strength in an A713 Sand Cast Aluminum Alloy, *Mater. Sci. Eng. A*, Vol. 527 (2010), pp. 3639-3644.
- 2) Q. Zeng, X.Y. Wen, T. **Zhai**, A Study of the Evolution of P Orientation {011} in a Cold Rolled Continuous Cast AA 3004 Aluminum Alloy after Annealing, *Mater. Met. Trans. A*, vol. 40A, (2009), pp. 2488-2497.
- 3) J.H. Xu, E.W. Kenik, T. **Zhai**, Brittle fracture in 50Mo-50Re alloys in slow strain rate tensile testing, *Phil. Mag. A*, Vol. 88, (2008), pp. 1543-1553.
- 4) T. **Zhai**, Strength Distribution of Fatigue Crack Initiation Sites in an Al-Li Alloy, *Metallurgical & Materials Transactions A*, 37A (2006), 3139-3148.
- 5) T. **Zhai**, J.X. Li, X. P. Jiang, M. D. Garratt and G. H. Gary, The Grain Boundary Geometry for Optimum Resistance to Growth of Short Fatigue Cracks in High Strength Al-Alloys, *Int. J. Fatigue*, Vol. 27 (2005), pp. 1202-1209.
- 6) J.X. Li, T. **Zhai**, M.D. Garratt, G.H. Bray, Four point bend fatigue of AA 2026 Al alloys, *Metallurgical and Materials Transaction A*, Vol. 36A (2005), pp. 2529-2539.
- 7) T. **Zhai**, A.J. Wilkinson, J.W. Martin, A Crystallographic Mechanism for Crack Propagation across Grain Boundaries, *Acta Materialia*, Vol. 48 (2000), pp. 4917-4927.
- 8) **Zhai**, T. J.W. Martin, G.A.D. Briggs, (1998), Time-resolved Acoustic Microscopy of Room Temperature Fatigue Damage in Al Single Crystals, *Phil. Mag. A*, Vol. 77, pp. 957-980.
- 9) **Zhai**, T. J.W. Martin, G.A.D. Briggs, (1996), Fatigue Damage in Single Crystal Aluminum IV: Secondary Slip, *Acta Materialia*, Vol. 44, pp. 3489-3496.
- 10) **Zhai**, T. J.W. Martin, G.A.D. Briggs, (1996), Fatigue Damage in Single Crystal Aluminum III: Lattice Rotation, *Acta Materialia*, Vol. 44, pp. 3477-3488.
- 11) **Zhai**, T. J.W. Martin, G.A.D. Briggs, (1996), Fatigue Damage in Single Crystal Aluminum II: TEM, *Acta Materialia*, Vol. 44, pp. 1729-1739.

- 12) **Zhai**, T. J.W. Martin, G.A.D. Briggs, (1996), Fatigue Damage in Single Crystal Aluminum I: On the Surface Containing the Slip Burgers Vector, *Acta Metallurgica*, Vol. 44, pp. 3477-3488.

d. Synergistic Activities

- 1) Currently serving as the PI of a NSF CAREER project to quantify the resistance of grain boundaries to short fatigue crack growth by both taking into account the twist and tilt angles of crack deflection at the grain boundaries, through experiments and theoretical modelling in high performance aluminium alloys.
- 2) Serving as the Advisor for an undergraduate student supported by a NSF REU project, to make 3D animations of 3D concepts/processes in materials science for use in materials education.
- 3) Organizer of Symposia on Fatigue and Corrosion Mechanism and on Al Alloys at TMS Meeting 2011.
- 4) Co-organizers of James Morris Symposium on Automotive Al Alloys at TMS Meeting 2006, and Symposia on Al Alloys at TMS Meetings 2009 and 2010.
- 5) Successfully completed projects, as the PI or co-PI, funded through NSF, DOD, Kentucky Science and Engineering Foundation, etc., over the last 8 years.
- 6) Serving as consultant for several law firms and companies, on failure analyses.
- 7) Serving as a DEPSCoR Review Committee and a reviewer for ORNL SHaRE user facilities.
- 8) Given seminars at numerous universities and conferences.

e. Collaborators & Other Affiliations

(i) Collaborators

Alan Lou	project	General Motor
Y.B. Zhang	papers	Department of Materials Engineering University of Jilin Building and Construction, China
E. A. Kenik	current project & paper	Oak Ridge National Laboratory
X.Y. Wen	papers	Center for Aluminum Technology, UK
Y.C. Wu	papers	Department of Physics, Wuhan University, China

(ii) Graduate and Postdoctoral Advisors

G.A.D. Briggs	graduate & postdoctoral advisor	Department of Materials, University of Oxford
J.W. Martin	graduate & postdoctoral advisor	Department of Materials, University of Oxford
J. G. Morris	postdoctoral advisor	Department of Chemical & materials,
A.J. Wilkinson	postdoctoral advisor	Department of Materials, University of Oxford
W. Arnold	postdoctoral advisor	Fraunhofer Institute for NDT (Izfp), Germany

(iii) Thesis Advisor and Postgraduate-Scholar Sponsor

Graduate Students

Jixia Li (Ph.D. graduate)	Advisor	(graduated 1/2006) University of Kentucky
Xiuping Jiang (Ph.D. graduate)	Advisor	(graduated 6/2006) University of Kentucky
Jianhui Xu (Ph.D. graduate)	Advisor	(graduated 11/2008) University of Kentucky
Qiang Zeng (Ph.D. graduate)	Advisor	(graduated 8/2009) University of Kentucky
Wei Wen (Ph.D. graduate)	Advisor	(current) University of Kentucky

Postdoctoral Researchers and Visiting Scholars

Sike Xia (7/2003-1/2004) and Jack Zheng, (5/2004-12/2005)

Visiting scholars:

Dr. Xifeng Alexander (7/2002-6/2003), Dr. Jin Li (11/2003-10/2004), Dr. Tang Li (1/2007-12/2007), Dr. Dejiu Shen (1/2008-6/2008), Dr. Yuanbin Zhang (1/2009-6/2009), Dr. Linghui Du (1/2009-12/2009), Prof. Zhiqiang Xu (current), Mr. Xiuchen (current), Prof. Xinliang Zang (current)