

## **JOHN J. LEWANDOWSKI**

Leonard Case Jr. Professor of Materials Science and Engineering  
Director - Center for Mechanical Characterization of Materials  
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### EDUCATION

Ph.D. - Metallurgical Engineering and Materials Science, Carnegie-Mellon, 1984  
M.E. - Metallurgical Engineering and Materials Science, Carnegie-Mellon, 1981  
B.S. - Metallurgical Engineering and Materials Science, Carnegie-Mellon, 1979

### EXPERIENCE

2003 - 2004 Overseas Fellow, Churchill College, University of Cambridge, UK  
Dept. Materials Science and Metallurgy, University of Cambridge, UK

2000 - Present Leonard Case Jr. Professor of Materials Science and Engineering,  
Case Western Reserve University, Cleveland, OH.

1994 - 2000 Professor, Dept. Materials Science and Engineering,  
Case Western Reserve University, Cleveland, OH.

1990 - 1994 Associate Professor, Dept. Materials Science and Engineering,  
Case Western Reserve University, Cleveland, OH.

1987 - Present Director-Mechanical Characterization Facility,  
Case Western Reserve University, Cleveland, OH.

1986 - 1990 Assistant Professor, Dept. Materials Science and Engineering,  
Case Western Reserve University, Cleveland, OH.

1987 Summer Visiting Scientist, High Temperature Materials Lab,  
Wright Patterson Air Force Base, Dayton, OH.

1986 Summer Visiting Scientist, Dept. Materials Science and Metallurgy,  
University of Cambridge, Cambridge, U.K.

1984 - 1986 N.A.T.O. Postdoctoral Fellow, Dept. Materials Science and Metallurgy,  
University of Cambridge, Cambridge, U.K.

1981 - 1984 HERTZ Foundation Fellow, Dept. Metall. Eng. and Materials Science,  
Carnegie-Mellon University, Pittsburgh, PA.

1979 - 1981 ALLEGHENY INT'L Fellow, Dept. Metall. Eng. and Materials Science,  
Carnegie-Mellon University, Pittsburgh, PA.

1975 - 1979 Co-Op Metallurgical Engineer, CHEVRON U.S.A., Inc.  
Richmond Refinery, Richmond, CA.

## BIOGRAPHY- JOHN J. LEWANDOWSKI

John J. Lewandowski is the Leonard Case, Jr., Professor of Engineering at Case Western Reserve University and Director of the Center for Mechanical Characterization of Materials. He received his B.S., M.E., and Ph.D. in Metallurgical Engineering and Materials Science at Carnegie Mellon University where he was a Hertz Foundation Fellow. His M.E. research was on hydrogen embrittlement of austenitic stainless steels, while his Ph.D. research focused on hydrogen embrittlement and fracture of steels used in the railroad industry. He also spent two years employed as Metallurgical Engineer/Failure Analyst at the Richmond Refinery Materials Laboratory, CHEVRON USA.

He subsequently spent two years as a NATO Postdoctoral Fellow in the Department of Materials Science and Metallurgy at Cambridge University, England, working with Prof. John F. Knott, FRS, on fracture and fatigue of engineering materials. Specific research projects included: stress relief embrittlement and fracture/fatigue of 2 1/4 Cr-1 Mo steels; Pb-induced solid metal embrittlement of aluminum alloy pressure vessels; and impurity effects on fracture of Al-Li alloys.

Upon returning to the U.S., he joined the faculty of the Department of Materials Science and Engineering at CWRU as an Assistant Professor. He is currently the Leonard Case, Jr., Professor of Materials Science and Engineering, and Director of the Center for Mechanical Characterization of Materials. His research and teaching interests are primarily in the areas of processing/structure/property relationships in ferrous and non-ferrous engineering materials; the effects of superposed pressure on deformation and fracture; fatigue and fracture of intermetallics and composites, bulk metallic glass, and layered/laminated materials; deformation processing; blast-resistant materials; advanced engineered materials systems; fracture and fatigue behavior of biomedical materials; failure analysis.

He has received a number of national and international awards for his teaching and research efforts. In the area of research, he has received the Allegheny International Research Fellowship at CMU, HERTZ Foundation Graduate Fellowship at CMU, NATO/NSF Postdoctoral Fellowship for Research at University of Cambridge, ALCAN Research Fellowship for Research at University of Cambridge, NSF Presidential Young Investigator Award, ASM Research Silver Medal, Charles Hatchett Award from the Institute of Metals (U.K.) for work on Nb, and was elected an Overseas Fellow at Churchill College, Cambridge University, where he spent a sabbatical year for 2003-04. He has received a Meritorious Service Award by the Case Alumni Association (CAA). One of his recent papers (Nature Materials) was selected for a News and Views Article in Nature Materials; was selected as an Editor's Choice Paper in Science; and was selected by the editors of Nature Materials as one of the ten most influential papers published in Nature Materials since 2002.

In the area of teaching and mentoring, he has advised over 50 MS students and over 20 Ph.D. students, in addition to 30 post-doctoral and visiting scholars. He has received the CTSC Technical Educator Award, SAE Ralph R. Teetor Educational Award, ASM Bradley Stoughton Award for Young Teachers, and the John S. Diekhoff Award for Graduate Teaching and Mentoring at CWRU. He has served on a number of panels organized by the National Research Council/National Academy of Sciences as well as the Institute of Mechanics and Materials at the University of California at San Diego. He is on the editorial board of three journals and has co-organized over 30 conferences, including one Gordon Conference on Physical Metallurgy. He was elected Fellow of ASM in 1995 and is past Chair of the ASM/TMS Joint Composites Committee. His publications and presentations number in excess of 225 and 525, respectively.

His personal interests include hiking, orienteering, coaching baseball, and competitive running. Recent PR's include winning the 2000 Cleveland 9th Street Mile in 4:27, and placing 8<sup>th</sup>/12<sup>th</sup>/16<sup>th</sup>/9<sup>th</sup>/9<sup>th</sup>/8<sup>th</sup>/10<sup>th</sup>/15<sup>th</sup>/18<sup>th</sup> overall in the 1999/2000/2001/2002/2004/2005/2006/2007/2008 Pittsburgh Great Race (5K) with times of 17:05/17:07/17:12/16:52/17:11/16:58/17:43/17:35/17:45, respectively. Masters All American Status was awarded for the 4:27 mile in 2000 and for the 16:52 performance in the 5K in 2002.

## PROFESSIONAL ACTIVITIES

### National Academy of Sciences/National Research Council:

STAR/BAST Committee, 1989-92  
Long Term Aging Effects Panel, 1994-95  
NRC Fellowship Evaluation Panel, 1997-2001  
AFSTB Committee on Hypersonics, 1997-98

### National Science Foundation:

NSF/PYI Workshop on Science, Math, and Engineering Education, 1990  
NSF Workshop on Processing of Advanced Structural Materials, 1992  
NSF/PYI Workshop on Future Problems in Mechanics of Materials, 1993  
NSF/NYI Evaluation Panel, 1994  
NSF/CAREER Evaluation Panel, 1998  
NSF MRSEC Review Panel, 2009

### Cleveland Chapter ASM International:

Executive Committee, 1988-92, 1993-96, 2000-02  
Chairman, Education Committee, 1990-91  
Chairman, Zay Jeffries Night Committee, 1987-88, 1992-93  
Chairman, Student Affairs Committee, 1986-87

### ASM International Committees:

ASM/TMS Joint Composites Committee, 1986-Present;  
Secretary, 1997; Vice Chair, 1999 - 2001; Chair, 2001 - 2003  
Scholarship Committee, 1993-2001; Education Committee, 1992-2001  
ASM Research Silver Medal Committee, 1999-present  
ASM Bradley Stoughton Award Committee, 2007-present  
International Materials Review Committee, 2007-2010

### TMS-AIME Committees:

Mechanical Metallurgy Committee, 1986-Present  
Student Affairs Committee, 1989-93  
Scholarship Committee, 1997-2001; Awards Committee, 2009-12

### Ohio Aerospace Institute (OAI):

Composites Steering Committee, 1989-95  
Affiliated Faculty Member, 1989-Present  
Scholarship Committee, 1989-94

### Materials Research Society: Member, 1987-Present

### Editorial Boards: Metall. Trans., Matl's Sci. and Tech., Adv. Matl's Proc., IMR

### Workshop Participant/Proposal Reviewer:

ARO, DARPA, AFOSR, ONR, DOE, NSF

### Journal Article Reviewer:

Science, Acta/Scripta Materialia, Materials Sci. and Eng. A, Nature,  
Matl's Trans A, Jnl Matl's Sci., Nature Matl's, Philos. Mag. A

## UNIVERSITY ACTIVITIES

### Case Western Reserve University

Graduate Studies Committee, Secretary, 1989-90, 1991-93, 1994, 2005-07  
Graduate Studies Committee, Chairman, 1990-91, 1993-94  
Graduate Studies Alumni Annual Fund Telethon, 1986-92  
Faculty Interviewer - CWRU Scholarship Day, 1986-92  
Faculty Senate Nominating Committee, 1996-2002, Chair, 2000-02  
President's Advisory Committee, 1995, 1999, 2008  
CSE Strategic Planning Committee, 2004-05  
CSE Ad Hoc SAGES Committee, 2004-05  
CWRU NSF-ACES Committee, 2004-present  
CWRU Honorary Degree Committee, 2006-09  
CSE Dean's Search Committee, 1996-97, 2006-07  
CSE Ad Hoc Staff Resources Committee, 2007-08  
CSE Appointments Committee, Chair, 2007-08  
Advanced Materials Institute, Co-Chair, 2009  
PRI Evaluation Team, 2007, 2008  
Executive Committee, 2001-03  
Research Committee, 1997-98

### Department of Materials Science and Engineering

Undergraduate Studies Committee, 1986-87, 1991-92, 1996-2007  
Director - Center for Mechanical Characterization of Materials, 1987-Present  
Graduate Studies Committee, 1986-Present; Chair, 2001-03, 2008-  
Faculty Advisor:  
-Class of 1989, 1998, 2001, 2007, 2012  
-Undergraduate Materials Society, 1988-94  
ASM Enhancement of Technical Awareness Award, 1991  
TMS Student Chapter of Excellence Award, 1991

## AWARDS AND HONORS

Meritorious Service Award - Case Alumni Association (CAA) (2008)  
Nature Materials (NM) Paper Selected One of 10 Most Influential NM Papers Since 2002 (2007)  
Nature Materials Paper Selected as Editors Choice Paper, Science (2006)  
John S. Diekhoff Award for Graduate Teaching and Mentoring, CWRU (2006)  
Case School of Engineering Graduate Teaching Award, CWRU (2006)  
Case School of Engineering Research Award, CWRU (2005)  
Elected Overseas Fellow - Churchill College, University of Cambridge (2003)  
Highly Cited Researcher (2003-Present)  
Leonard Case Jr. Professorship of Engineering (2000-present)  
CTSC Technical Educator Award (2000)  
Institute of Metals (U.K.) Charles Hatchett Award (1999)  
ASM Research Silver Medal (1997)  
International Site Visit Panel Member - Ministry of University Affairs, Thailand (1996)  
Fellow - ASM International (1995)  
Who's Who in the World Listing (1995-Present)  
Nominee - John S. Diekhoff Award for Graduate Teaching, CWRU (1994, 2006)  
SAE Ralph R. Teetor Educational Award (1992)  
Gordon Conference on Physical Metallurgy Speaker (1992), Discussion Leader (1994),  
Co-Vice Chair (1998), Co-Chair (2000)  
American Men and Women of Science Listing (1991-Present)  
Nominee - Carl F. Wittke Award for Undergraduate Teaching, CWRU (1991, 2000)  
Nominee - Mortarboard Outstanding Professor of the Year, CWRU (1991)  
Nominee -  $\tau\beta\pi$  Professor of the Year, CWRU (1990, 2007)  
1989 Presidential Young Investigator - National Science Foundation (1989-94)  
ASM Bradley Stoughton Award for Young Teachers (1989)  
ALCAN Postdoctoral Fellow - University of Cambridge (1985-86)  
N.A.T.O./NSF Postdoctoral Fellowship in Science - University of Cambridge (1984-85)  
HERTZ Foundation Fellowship - Carnegie Mellon University (1981-83)  
ALLEGHENY INT'L Fellowship - Carnegie Mellon University (1979-81)  
ASM Metallurgical Scholar - Carnegie Mellon University (1979)

## CONFERENCE ORGANIZATION

- TMS-AIME Topical Symposium - Micromechanisms in Composites - Phoenix  
TMS-AIME Meeting, Spring, 1987.
- Program Committee - ICCI-II - International Conference on Composite  
Interfaces, Summer, 1988.
- International Advisory Committee - ICCI-III, Summer, 1990.
- NSF-PYI Workshop "Future Problems in Mechanics/Materials", Summer, 1993.
- International Conference on Structural Intermetallics - ISSI-I, Co-Editor and  
Program Committee, Summer, 1993.
- Intermetallic Matrix Composites - III, Co-Editor, MRS, Spring, 1994.
- International Advisory Committee - International Conference on Environmental  
Effects on Materials, China, Summer, 1994
- TMS-AIME Topical Symposium - Intrinsic and Extrinsic Mechanisms in MMCs,  
Las Vegas TMS-AIME Meeting, Spring, 1995.
- Layered Materials for Structural Applications - I, Co-Editor, MRS, Spring, 1996.
- Microscopy of Composites Materials III, International Advisory Committee,  
Oxford, U.K., Spring, 1996.
- Microscopy of Composites Materials IV, International Advisory Committee,  
Oxford, U.K., Spring, 1998.
- Physical Metallurgy Gordon Conference-Co-Vice Chair, Summer, 1998
- ASM/TMS Topical Symposium, Research and Development Efforts on MMCs,  
Nashville, TN, Spring, 2000.
- Microscopy of Composite Materials V, International Advisory Committee,  
Oxford, U.K., Spring, 2000.
- Physical Metallurgy Gordon Conference, Co-Chair, Summer, 2000.
- High Pressure 2000, Organizing Committee, Slavyanogorski, Ukraine, Fall, 2000.
- International Conference on Structural Intermetallics – ISSI-III,  
Arrangements Chair, Fall, 2001.
- International Conference on Fracture – ICF-10, Focused Session on MMC's

Chair, Fall, 2001.

Microscopy of Composite Materials VI, International Advisory Committee,  
Oxford, U.K., Spring, 2002.

TMS-AIME International Symposium on Creep and Fatigue in MMCs,  
Seattle, WA, TMS-AIME Meeting, Spring, 2002.

TMS International Symposium on Mechanisms and Mechanics of Fracture,  
Columbus, OH, TMS Meeting, Fall, 2002.

Composites at Lake Louise, Organizing Committee, Lake Louise, Canada,  
Fall, 2003.

ASM/TMS International Symposium on Affordable MMC's for High  
Performance Applications, Chicago, IL, Fall, 2003.

ASM/TMS Symposium on Structure-Property Relationships in High Performance  
Ferrous Based Systems Possessing Composite-like Structures, Chicago,  
IL, Fall, 2003.

TMS Symposium on Mechanical Behavior of Body-Centered Cubic (BCC)  
Metals and Alloys, New Orleans, LA, Fall, 2004.

Workshop on X-Ray Tomography, Churchill College, Univ. Cambridge,  
Cambridge, U.K., Spring, 2005.

EUROMAT 2005/TMS Symposium on Bulk Metallic Glasses, Prague, Czech  
Republic, Fall, 2005.

TMS/ASM International Symposium on Fracture of Multi-component Systems,  
Pittsburgh, PA, Fall, 2005.

Composites at Lake Louise, Organizing Committee, Lake Louise, Canada,  
Fall, 2005.

ASM/TMS International Symposium on Advanced Metallic Composites and  
Alloys for High Performance Applications, Orlando, FLA, Spring 2007.

Composites at Lake Louise, Organizing Committee, Lake Louise, Canada,  
Fall, 2007.

Composites at Lake Louise, Organizing Committee, Lake Louise, Canada,  
Fall, 2009

## BOOKS, BOOK CHAPTERS, MAJOR REVIEWS

Future Problems in Mechanics and Materials, (J.J. Lewandowski, ed.), UCSD-IMM, San Diego, CA, 1993.

Structural Intermetallics I-ISSI, (R. Darolia, J.J. Lewandowski, C.T. Liu, P.L. Martin, D.B. Miracle and M.V. Nathal, eds.), TMS, Warrendale, PA, 1993.

Intermetallic Matrix Composites III, (J.A. Graves, R.R. Bowman, and J.J. Lewandowski, eds.), MRS, Vol. 350, Pittsburgh, PA, 1994.

Intrinsic and Extrinsic Fracture Mechanisms in Inorganic Composites, (J.J. Lewandowski and W.H. Hunt, Jr., eds.), TMS, Warrendale, PA, 1995.

Layered Materials for Structural Applications - I, (J.J. Lewandowski, C.H. Ward, M.R. Jackson, and W.H. Hunt, Jr., eds.), MRS, Pittsburgh, PA, 1996.

“Mechanical Behavior of Laminated Metal Composites”, D.R. Lesuer, C.K. Syn, O.D. Sherby, J. Wadsworth, J.J. Lewandowski, and W.H. Hunt, Jr., International Materials Reviews, 41, pp. 169-197, 1996.

“Fracture and Fatigue of Composites”, J.J. Lewandowski and P.M. Singh, ASM Metals Handbook, ASM International, Materials Park, OH, Vol. 19, pp. 895-904, 1996.

“Effects of Hydrostatic Pressure on Mechanical Behavior and Deformation Processing of Materials”, J.J. Lewandowski and P. Lowhaphandu, International Materials Reviews, 43 (4), pp. 145-188, 1998.

“Fracture and Fatigue of Particulate Composites”, J.J. Lewandowski, in Comprehensive Composite Materials (A. Kelly and C. Zweben, eds.), Vol. 3 – Metal Matrix Composites (T.W. Clyne, ed.), Elsevier, pp. 151-187, 2000.

Mechanisms and Mechanics of Fracture: Symposium in Honor of Prof. J.F. Knott (W.O. Soboyejo, J.J. Lewandowski, R.O. Ritchie, eds.), TMS, Warrendale, PA, 2002.

Affordable MMC: for High Performance Applications, (A.B. Pandey, K. L. Kendig, J. J. Lewandowski, eds.), TMS, Warrendale, PA, 2003.

“Hydrostatic Extrusion of Metals and Alloys”, J.J. Lewandowski and A. Awadallah, ASM Metals Handbook, ASM International, Materials Park, OH, Vol. 14A, pp. 440-447, 2005.

- “Forging of Discontinuously Reinforced Aluminum Composites”, A. Awadallah and J.J. Lewandowski, ASM Metals Handbook, ASM International, Materials Park, OH, Vol. 14A, pp. 366-373, 2005.
- “Brittle Fracture”, J.J. Lewandowski, Mc-Graw Hill Encyclopedia of Science & Technology, Mc-Graw Hill, NY, NY, 2006.
- “Metal Matrix Composites: Types, Reinforcement, Processing, Properties and Applications”, T.S. Srivatsan and J.J. Lewandowski, in Advanced Structural Materials – Properties, Design Optimization and Application., (W.O Soboyejo and T.S. Srivatsan, eds.), CRC Press, Boca Raton, FLA, pp. 275-357, 2006
- “Properties of Discontinuously-Reinforced Metal Matrix Composites and Laminates”, H.A. Hassan and J.J. Lewandowski, in Materials Science for Engineers and Technologists, (A.K. Gupta, ed.), submitted, 2006.
- “X-ray Tomography of Cracks and Crack Growth”. P.J. Withers and J.J. Lewandowski, Special Issue in Materials Science and Technology, Volume 22, 2006, pp. 1009-1098.
- “Mechanical Behavior of Metallic Glasses and Applications”, M.Li, J. Eckert, L. Kecskes, and J.J. Lewandowski, Focus Issue in Journal of Materials Research, 22(2), pp. 255- 556, 2007.
- “Mechanical Properties of Bulk Metallic Glasses”, R. Yavari, J.J. Lewandowski, and J. Eckert, Special Issue in MRS Bulletin, 32(8), pp. 635-638, 2007.

## **JOHN J. LEWANDOWSKI - PUBLICATIONS**

### **1980**

Lewandowski, J.J., and Thompson, A.W. (1980). "The Effect of Austenite Stability on the Sustained-Load Cracking of Stainless Steels in One Atmosphere Hydrogen", Hydrogen Effects in Metals, Proc. Third Int'l. Conf. on Hydrogen, (I.M. Bernstein and A.W. Thompson, eds.), TMS-AIME, Warrendale, PA, pp. 629-37.

### **1981**

Christodoulou, L., Stevens, M.F., Lewandowski, J.J., Bernstein, I.M., and Thompson, A.W. (1981). "Studies in Microstructural Effects in Hydrogen Embrittlement of Steels", Environmental Degradation of Engineering Materials, Proc. Third Int'l. Conf. on Environmental Degradation of Engineering Materials, (M.R. Louthan, Jr., R.P. McNitt, and R.D. Sisson, Jr., eds.), Va. Tech. Printing, Blacksburg, VA, pp. 161-75.

### **1983**

Lewandowski, J.J. (1983). "Hydrogen Effects on Cleavage Fracture in Fully Pearlitic 1080 Steel", Ph.D. Thesis, Carnegie-Mellon University.

### **1984**

Lewandowski, J.J., and Thompson, A.W. (1984). "Microstructural Effects on the Cleavage Fracture Stress in Fully Pearlitic 1080 Steel", - Advances in Fracture Research ICF6, Vol. 2, (S.R. Valluri, D.M.R. Taplin, P. Rama Rao, J.F. Knott, R. Dubey, eds.), Pergamon Press, pp. 1515-1522.

### **1985**

Lewandowski, J.J., and Knott, J.F. (1985). "Microstructural Effects on Flow Localization in 7XXX Al Alloys", Strength of Metals and Alloys - ICSMA 7, Pergamon Press, Vol. 2, pp. 1193-1200.

Ellis, M.B.D., Lewandowski, J.J., and Knott, J.F. (1985). "Impurity Effects on Sustained Load Cracking of 2¼ Cr - 1 Mo Steel", Strength of Metals and Alloys - ICSMA 7, Pergamon Press, Vol. 2, pp. 1087-1194.

### **1986**

Alexander, D.J., Lewandowski, J.J., and Thompson, A.W. (1986). "Yielding and Work Hardening Effects in Notched Bend Bars", J. Mech. Phys. Solids, 34, pp. 433-454.

Lewandowski, J.J., and Thompson, A.W. (1986). "Microstructural Effects on Ductility in Fully Pearlitic Steels", Met. Trans. A, 17A, pp. 461-472.

Lewandowski, J.J., and Thompson, A.W. (1986). "Microstructural Control of the Cleavage Fracture Stress in Fully Pearlitic Steels", Met. Trans. A, 17A, pp. 1769-1786.

Lewandowski, J.J., Ellis, M.B.D., and Knott, J.F. (1986). "Effects of Impurity Level and Test Environment on Sustained Load Cracking of 2¼ Cr - 1 Mo Steel", Fracture Control of Engineering Structures - ECF 6, (H.C. Van Elst and A. Bakker, eds.), EMAS, Amsterdam, Vol. 3, pp. 1905-1915.

Lewandowski, J.J., and Thompson, A.W. (1986). "Hydrogen Effects on Cleavage Fracture in Fully Pearlitic Eutectoid Steel", Fracture Control of Engineering Structures - ECF-6, (H.C. Van Elst and A. Bakker, eds.), EMAS, Amsterdam, Vol. 3, pp. 1985-1995.

### **1987**

Lewandowski, J.J., and Thompson, A.W. (1987). "Modelling Cleavage Fracture in Fully Pearlitic Microstructures", Acta Met., 35, pp. 1453-1462.

Lewandowski, J.J., Hipsley, C.A., Ellis, M.B.D., and Knott, J.F. (1987). "Impurity Effects on Sustained Load Cracking of 2¼ Cr - 1 Mo Steels: I Crack Initiation", Acta Met., 35, pp. 593-609.

Lewandowski, J.J., Hipsley, C.A., Kohler, V., and Knott, J.F. (1987). "Impurity Effects on Sustained-Load Cracking of 2¼ Cr - 1 Mo Steels: II Crack Propagation", Acta Met., 35, pp. 2081-2091.

Lewandowski, J.J., Kohler, V., and Holroyd, N.J.H. (1987). "Effects of Pb on the Sustained Load Cracking of Al-Mg-Si Alloys at Ambient Temperatures", Materials Sci. and Eng., 96, pp. 185-195.

Lewandowski, J.J., Liu, C, and Hunt, W.H. (1987). "Microstructural Effects on Fracture of SiC Particulate Reinforced 7XXX Aluminum Alloys", Powder Metallurgy Composites, (P. Kumar, K.M. Vedula, and A.M. Ritter, eds.), TMS-AIME, Warrendale, PA, pp. 117-39.

### **1988**

Lewandowski, J.J., and Hipsley, C.A. (1988). "The Nucleation of High Temperature Brittle Intergranular Fracture in 2¼ Cr - 1 Mo Steel", Met. Trans. A, 19A, pp. 3005-3011.

Khadkikar, P., Rigney, J., Lewandowski, J.J., and Vedula, K.M. (1988). "Notch Effects on Tensile and Bend Properties of Ni<sub>3</sub>Al and Ni<sub>3</sub>Al+B", Proc. Materials Research Symposium, (C.C. Koch, N.S. Stoloff, C.T. Liu, and A.J. Taub, eds.), Pergamon Press, Vol. 133, pp. 523-528.

Rigney, J., Khadkikar, P., Lewandowski, J.J., and Vedula, K.M. (1988). "Strength and Toughness of Composite Materials Based on Nickel Aluminide Matrices", Proc. Materials Research Symposium, (C.C. Koch, N.S. Stoloff, C.T. Liu, and A.J. Taub, eds.), Pergamon Press, Vol. 122, pp. 603-608.

Liu, C., Pape, S., and Lewandowski, J.J. (1988). "Effects of Matrix Microstructure and Interfaces on Influencing Monotonic Crack Propagation in SiC/Aluminum Alloy Composites", Proceedings of ICCI-II, (H. Ishida, ed.), Elsevier, N.Y., pp. 513-25.

Lewandowski, J.J., Dimiduk, D., and Mendiratta, M. (1988). "Fracture of Nb-Nb-Silicide Composites", Proc. Materials Research Symposium - High Temperature Composites, (S. Fishman, F. Lemkey, A.G. Evans, eds.), Pergamon, Vol. 20, pp. 103-109.

Kim, Y.S., Holroyd, N.J.H., and Lewandowski, J.J. (1988). "Pb-Induced Solid Metal Embrittlement of Al-Mg-Si Alloys at Ambient Temperatures", in Proc. International Conf. on Environment-Induced Cracking of Metals, (M.B. Ives, ed.), NACE, Houston, TX, pp. 371-377.

Lewandowski, J.J., and Liu, C. (1988). "Microstructural Effects on Fracture Micromechanisms in Lightweight Metal Matrix Composites", in Proc. International Symposium on Adv. Structural Materials, (D. Wilkinson, ed.), Proc. Met. Soc. of Canadian Inst. Mining and Metallurgy, Pergamon Press, Vol. 2, pp. 23-33.

## **1989**

Lewandowski, J.J., Liu, C., and Hunt, W.H. Jr. (1989). "Effects of Microstructure and Particle Clustering on Fracture of an Aluminum Metal Matrix Composite", Materials Sci. & Eng., A107, pp. 241-255.

Lewandowski, J.J., Liu, C., and Hunt, W.H. Jr. (1989). "Effects of Microstructure and Particle Clustering on Fracture of an Aluminum Metal Matrix Composite", Interfacial Phenomena in Composites, (S. Suresh and A. Needleman, eds.), Elsevier, pp. 241-257.

Lewandowski, J.J., Liu, D.S., and Manoharan, M. (1989). "Effects of Hydrostatic Pressure on Fracture of a Particulate Reinforced MMC", Scripta Met., 23, pp. 253-256.

Lewandowski, J.J., and Manoharan, M. (1989). "Effects of Notch Root Radius on Fracture Toughness of Metal Matrix Composites", Int'l. Journal Fracture, 40-2, R31-34.

Lewandowski, J.J., Liu, D.S., and Manoharan, M. (1989). "Effects of Microstructure on Fracture of an Aluminum Alloy and an Aluminum Composite Tested Under Low Levels of Superimposed Pressure", Met. Trans. A, 20A, pp. 2409-17.

Lewandowski, J.J., Manoharan, M., and Liu, C. (1989). "Microstructure and Particle Size Effects on Fracture in Aluminum Metal Matrix Composites", Advances in Fracture Research - ICF-7, (K. Salama, ed.), Pergamon Press, Vol. 4, pp. 2977-2987.

Lewandowski, J.J., and Liu, D.S. (1989). "Pressure Effects on Fracture of Composites", Lightweight Alloys for Aerospace Applications, (E.W. Lee, F.H. Chia, and N.J. Kim, eds.), TMS-AIME, Warrendale, PA, pp. 359-364.

Manoharan, M., and Lewandowski, J.J. (1989). "Effects of Aging Condition on the Fracture Toughness of 2XXX and 7XXX Aluminum Composites", Scripta Met., 23, pp. 301-305.

Lewandowski, J.J. (1989). "Processing and Mechanical Properties of Lightweight Structural Composites", SAMPE Quarterly, 20, pp. 33-37.

Khadkikar, P., Vedula, K.M., and Lewandowski, J.J. (1989). "Notch Effects on Tensile Behavior of Ni<sub>3</sub>Al and Ni<sub>3</sub>Al+ B", Met. Trans. A, 20A, pp. 1247-1255.

Manoharan, M., and Lewandowski, J.J. (1989). "*In-situ* Deformation Studies of an Aluminum Metal-Matrix Composite in a Scanning Electron Microscope", Scripta Met. 23, pp. 1801-1804.

Liu, D.S., Manoharan, M., and Lewandowski, J.J. (1989). "Matrix Effects on the Ductility of Aluminum Based Composites Tested Under Hydrostatic Pressure", Journal of Materials Science Letters, 8, pp. 1447-1449.

Liu, D.S., Manoharan, M., and Lewandowski, J.J. (1989). "Effects of Microstructure on the Behavior of an Aluminum-Alloy and an Aluminum Matrix Composite Tested Under Low Levels of Superimposed Hydrostatic Pressure", Metallurgical Transactions A, 20(11), pp. 2409-2417.

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## **2009**

Delgado, I.R., Steinetz, B.M., Rimnac, C.M., and Lewandowski, J.J. (2009). “Fatigue Crack Growth Behavior Evaluation of Grainex Mar-M 247 for NASA’s High Temperature, High Speed Turbine Seal Test Rig”, Journal of Engineering for Gas Turbines and Power, 131, pp. 1-1 – 1-12.

## **JOHN J. LEWANDOWSKI-TECHNICAL PRESENTATIONS**

**\*\*Denotes Invited Lecture**

### **1980**

"Effects of Austenite Stability on Fracture Behavior of Austenitic Stainless Steels in Gaseous Hydrogen", J.J. Lewandowski, A.W. Thompson and I.M. Bernstein, Fall Meeting, TMS-AIME, Pittsburgh, PA, October 8, 1980.

### **1981**

"Studies on Microstructural Effects on Hydrogen Embrittlement of Steels", L. Christodoulou, M.F. Stevens, J.J. Lewandowski, A.W. Thompson and I.M. Bernstein, Proceedings on Environmental Degradation of Engineering Materials, Blacksburg, VA, September 22, 1981.

### **1982**

"Yielding Behavior of Notched Bend Bars", J.J. Lewandowski, D.J. Alexander, A.W. Thompson and I.M. Bernstein, Fall Meeting, TMS-AIME, St. Louis, MO, October 25, 1982.

"Hydrogen Effects on Cleavage Fracture of Pearlitic 1080 Steel", J.J. Lewandowski and A.W. Thompson, Fall Meeting, TMS-AIME, St. Louis, MO, October 28, 1982.

### **1983**

"Hydrogen Effects on Fracture of Pearlitic 1080 Steel", J.J. Lewandowski and A.W. Thompson, Fall Meeting, TMS-AIME, Philadelphia, PA, October 3, 1983.

### **1984**

"Microstructural Effects on the Cleavage Fracture Stress in Fully Pearlitic 1080 Steel", J.J. Lewandowski and A.W. Thompson, ICF-6, New Delhi, India, December 5, 1984.

\*\* "Cleavage Fracture in Pearlitic Steels", J.J. Lewandowski, University of Cambridge, Department of Metallurgy and Materials Science, Cambridge, U.K., April 12, 1984.

### **1985**

"Microstructural Effects on Flow Localization in 7XXX Al Alloys", J.J. Lewandowski and J.F. Knott, ICSMA-7, Montreal, Canada, August 12, 1985.

"Impurity Effects on Sustained Load Cracking of 2¼ Cr - 1 Mo Steel", J.J. Lewandowski, M.B.D. Ellis, and J.F. Knott, ICSMA-7, Montreal, Canada, August 16, 1985.

### **1986**

"Impurity Effects on Sustained Load Cracking of 2¼ Cr - 1 Mo Steel at Elevated Temperatures", J.J. Lewandowski, M.B.D. Ellis, and J.F. Knott, Spring Meeting, TMS-AIME, New Orleans, LA, March 4, 1986.

\*\* "Microstructural Effects on Cleavage in Fully Pearlitic Eutectoid Steel", J.J. Lewandowski and A.W. Thompson, Spring Meeting, TMS-AIME, New Orleans, LA, March 4, 1986.

"Hydrogen Effects on Cleavage Fracture in Fully Pearlitic Eutectoid Steel", J.J. Lewandowski and A.W. Thompson, ECF-6, Amsterdam, Netherlands, June 19, 1986.

"Impurity Effects on Sustained Load Cracking of 2¼ Cr - 1 Mo Steel at High Temperatures", ECF-6, Amsterdam, Netherlands, June 20, 1986.

\*\* "Micromechanisms of Fracture-Applications of Blunt Notched Specimens", J.J. Lewandowski, ALCOA Research Laboratory Invited Seminar, ALCOA Center, PA, July 28, 1986.

"Impurity Effects on Creep Crack Propagation in 2¼ Cr - 1 Mo", Fall Meeting, ASM Materials Week '86, Orlando, FL, October 6, 1986.

"Intergranular Slow Crack Growth in Al-Mg-Si Alloys", Fall Meeting, ASM Materials Week '86, Orlando, FL, October 6, 1986.

### **1987**

"Microstructural Effects on Fracture of P/M 7XXX Series Aluminum Alloy Matrix SiC Particulate Reinforced Composites", J.J. Lewandowski, C. Liu, and W.H. Hunt, Jr., Spring Meeting TMS-AIME, Denver, CO, February 24, 1987.

"Microstructural Effects on Fracture of P/M 7XXX Composites, C. Liu and J.J. Lewandowski, 1987 Northeast Regional Meeting - TMS-AIME, May 27-29, Stevens Institute of Technology, Hoboken, NJ, May 28, 1987.

\*\* "Fracture of Nb-Nb Silicide Composites-Ductile Phase Toughening", J.J. Lewandowski, Wright Patterson Air Force Base Invited Seminar, Dayton, OH, Sept. 11, 1987.

"Microstructural Effects on Fracture of 7XXX SiC Composites", C. Liu and J.J. Lewandowski, Fall Meeting TMS-AIME, Cincinnati, OH, October 12, 1987.

\*\* "Micromechanisms of Fracture in Particulate Reinforced Composites", J.J. Lewandowski, Los Alamos National Lab, Los Alamos, NM., Invited Seminar, October 18, 1987.

\*\* "Micromechanisms of Fracture in Particulate Reinforced Composites", J.J. Lewandowski, Sandia National Laboratory Technical Seminar, Livermore, CA, October 21, 1987.

"Effects of Pb on Sustained Load Cracking of Al-Mg-Si Alloys", Y. S. Kim, N. J. H. Holroyd and J. J. Lewandowski, Fall Meeting TMS-AIME, Cincinnati, OH, October 12, 1987.

"Fracture of Nb-Si Alloys", J.J. Lewandowski, 1987 High Temperature Materials Workshop, Dayton, OH, October 23, 1987.

\*\* "Impurity Effects on Stress Relief Cracking in 2¼ Cr - 1 Mo Steels", J.J. Lewandowski, Invited Seminar at David Taylor Naval Ship R&D Center, Annapolis, MD, November 24, 1987.

\*\* "Mechanisms of Deformation and Fracture in Composites", J.J. Lewandowski, NASA Langley Research Lab, Hampton, VA, November 25, 1987.

### **1988**

"Fracture Mechanisms in Discontinuous Composites", J.J. Lewandowski, 10th Annual Meeting Discontinuous Reinforced Composites, Park City, UT, January 6, 1988.

"Micromechanisms of Fracture in Al-SiC", J.J. Lewandowski, URI Winter Study Group, Santa Barbara, CA, January 6-9, 1988.

- \*\* "Micromechanisms of Fracture in MMC's", J.J. Lewandowski, Invited Lecture - Special Topical Symposia, Spring Meeting TMS-AIME, Phoenix, AZ, January 27, 1988.
- \*\* "Pb Induced Solid Metal Embrittlement", J.J. Lewandowski, Invited Seminar, Brush Wellman Inc., Cleveland, OH, February 25, 1988.
- "Microstructural Effects on Nb-Nb Silicide Composite Properties", J.J. Lewandowski, D. Dimiduk, W. Kerr, and M.G. Mendiratta, Spring Meeting MRS - Reno, NV, April 8, 1988.
- "Microstructures and Phase Relationships in Nb-Nb<sub>5</sub>-Si<sub>3</sub> *In-Situ* Composites", M. Mendiratta, D. Dimiduk, and J.J. Lewandowski, MRS Spring Meeting, Reno, NV, April 9, 1988.
- \*\* "Microstructural Effects on Deformation and Fracture Micromechanisms in Metal Matrix Composites", Invited Lecture, Center for Composite Materials and Structures, Virginia Polytechnic University, Blacksburg, VA, May 4, 1988.
- \*\* "Effects of Reinforcement Distribution on Mechanical Properties of Metal-Matrix Composites", J.J. Lewandowski and W.H. Hunt, Jr., Symposium on Interfacial Phenomena in Composites, Processing, Characterization and Mechanical Properties, Salve Regina College, Newport, RI, June 1-3, 1988.
- "Effects of Matrix Microstructure and Interfaces on Monotonic Crack Propagation in SiC/Aluminum Alloy Composites", J.J. Lewandowski and C. Liu, ICCI-II, Case Western Reserve University, Cleveland, OH, June 13-17, 1988.
- "Processing and Mechanical Properties of Lightweight Structural Composites", J.J. Lewandowski, SAMPE Meeting, Dayton, OH, August 3, 1988.
- \*\* "Fracture of Aluminum Based Composites", J.J. Lewandowski, ALCOA Technical Center Special Seminar, ALCOA Center, PA, August 12, 1988.
- "Microstructural Effects on Fracture Micromechanisms in Lightweight Metal Matrix Composites", J.J. Lewandowski, 27th Annual Conference of Metallurgists, Montreal, Canada, August 28, 1988.
- \*\* "Pb Embrittlement of Al Alloys", J.J. Lewandowski, ALCAN Intl. Ltd., Seminar, Banbury, U.K., September 5, 1988.
- "Notch Effects on Fracture of Ni<sub>3</sub>Al and Ni<sub>3</sub>Al+B", P. Khadkikar, J.J. Lewandowski, and K.M. Vedula, Fall Meeting TMS-AIME, Chicago, IL, September 26, 1988.
- "Effect of Grain Boundary Carbides on the Ductility of an Fe-6.5 wt.% Si Alloy", A.W. Bhagwat, J.J. Lewandowski and G.M. Michal, Fall Meeting TMS-AIME, Chicago, IL, September 27, 1988.
- "Microstructural Effects on Composite Toughness", J.J. Lewandowski, Fall Meeting TMS-AIME, Chicago, IL, September 29, 1988.
- "Pb-Induced Solid Metal Embrittlement of Al-Mg-Si Alloys at Ambient Temperatures", Y.S. Kim, N.J.H. Holroyd, and J.J. Lewandowski, NACE Int'l. Conference on Environment Induced Cracking of Metals, Kohler, WI, October 4, 1988.

\*\* "Microstructure and Stress State Effects on Fracture of Metal Matrix Composites", University of Pennsylvania, Department of Materials Science and Engineering, Philadelphia, PA, November 1, 1988.

\*\* "Stress State Effects on Fracture of Composites", MTS Corporation, Minneapolis, MN, November 8, 1988.

"Notch Effects on Tensile and Bend Properties of Ni<sub>3</sub>Al", P. S. Khadkikar, J. D. Rigney, J. J. Lewandowski, and K. M. Vedula, MRS Meeting, Boston, MA, November 29, 1988.

"Composite Materials Based on Nickel Aluminide Matrices", J. D. Rigney and J. J. Lewandowski, MRS Meeting, Boston, MA, December 1, 1988.

### **1989**

"Processing and Properties of Metal Matrix Composites", NASA Technical Review Meeting, NASA-CCDS, January 16, 1989.

"Fracture of Metal/Alumina Interfaces", Alumina Workshop, Case Western Reserve University Cleveland, OH, January 26, 1989.

"Pressure Effects on Fracture of Particulate Reinforced Metal Matrix Composites", Spring TMS-AIME Meeting, Las Vegas, NV, February 28, 1989.

\*\* "Microstructural Effects on Fracture in Al-Based Metal Matrix Composites", Wright Patterson Air Force Base, Dayton, OH, March 17, 1989.

"Microstructure and Particle Size Effects on Fracture of Metal Matrix Composites", ICF-7, Houston, TX, March 20-24, 1989.

\*\* "Effects of Microstructure and Stress State on Fracture in Metal Matrix Composites", TMS Annual Meeting, Detroit, MI, May 1, 1989.

\*\* "Use of Blunt Notch Specimens in Fracture Experiments", University of Michigan, Department of Materials Science and Engineering, Ann Arbor, MI, May 2, 1989.

\*\* "Interface Effects on Fracture in Particle Hardened Materials", ALCOA Center Technical Seminar, ALCOA Center, PA, June 2, 1989.

\*\* "Slow Crack Growth in Al-Mg-Si Alloys", ALCAN Int'l, Banbury, U.K., July 19, 1989.

"Hydrogen Effects on the Cleavage Fracture Stress of Pearlitic Steel", Fourth Int'l Conf. on Hydrogen, Jackson, WY, September 15, 1989.

\*\* "Fracture of Al-Based Composites", ALCAN Special Technical Meeting, Chicago, IL., September 26-28, 1989.

"Effects of Pb on Fracture of Al-Mg-Si Alloys During Cyclic Loading", Y.S. Kim, N.J.H. Holroyd, and J.J. Lewandowski, Fall Meeting TMS-AIME, Indianapolis, IN, October 2, 1989.

"Effects of Microstructure on the Behavior of an Aluminum Matrix Composite Tested Under Low Levels of Hydrostatic Pressure", D.S. Liu, C. Liu, and J.J. Lewandowski, Fall Meeting

TMS-AIME, Indianapolis, IN, October 2, 1989.

"Fracture Initiation and Growth Toughness in Metal Matrix Composites", M. Manoharan and J.J. Lewandowski, Fall Meeting TMS-AIME, Indianapolis, IN, October 2, 1989.

"Fracture Toughness of Cu-Alumina Interfaces", T. Spear and J.J. Lewandowski, Fall Meeting TMS-AIME, Indianapolis, IN, October 2, 1989.

"Crack Growth Studies in a 7XXX Series Aluminum Alloy Based Metal Matrix Composite", M. Manoharan and J.J. Lewandowski, Fall Meeting TMS-AIME, Indianapolis, IN, October 2, 1989.

"Properties of Squeeze Cast Al-SiC Composites", T. Studer, J.J. Lewandowski and J.F. Wallace, ASM Special Symposia, Indianapolis, IN, October 4, 1989.

"Fracture of Composites under Mixed Mode Loading Conditions", M. Manoharan and J.J. Lewandowski, ASM Special Symposia, Indianapolis, IN, October 4, 1989.

\*\* "Fracture Toughness of Advanced Composites", 1989 High Temperature Materials Workshop, Wright Patterson Air Force Base, Dayton, OH, December 14-15, 1989.

## **1990**

\*\* "Effects of Superposed Pressure on Fracture of Composites", UCSB Winter Study Group Meeting, University of California Santa Barbara, Santa Barbara, CA, January 4, 1990.

\*\* "Deformation and Fracture of Metal Matrix Composites", The Ohio State University, Columbus, OH, February 9, 1990.

\*\* "Effects of Stress State and Microstructure on Fracture of Metal Matrix Composites", Michigan State University, East Lansing, MI, February 13, 1990.

\*\* "Microstructure and the Fracture of Metal Matrix Composites", Center for Applied Polymer Research, Case Western Reserve University, Cleveland, OH, March 14, 1990.

"Fracture Toughness of Nickel Aluminides", J.D. Rigney and J.J. Lewandowski, MRS Meeting, San Francisco, CA, April 19, 1990.

"Fracture of Nickel Aluminide Composites", J.D. Rigney, J.J. Lewandowski, and K.M. Vedula, MRS Meeting, San Francisco, CA, April 20, 1990.

\*\* "Deformation and Fracture of Al-Based Composites", University of Michigan, Ann Arbor, MI, May 9-10, 1990.

\*\* "Fracture of Discontinuous Composites", AEROMAT Conference, Long Beach, CA, May 21-24, 1990.

\*\* "Microstructural Effects on Fracture of MMC's", 15th International Nathiagali Conference on Physics and Contemporary Needs, Nathiagali, Pakistan, June 17, 1990.

\*\* "Fracture Toughness of Intermetallics and Intermetallic Composites", 15th International Nathiagali Conference on Physics and Contemporary Needs, Nathiagali, Pakistan, June 18, 1990.

\*\* "Toughening of Brittle Materials", 15th International Nathiagali Conference on Physics and Contemporary Needs, Nathiagali, Pakistan, June 19, 1990.

\*\* "Fracture of Pearlitic Steels", 15th International Nathiagali Conference on Physics and Contemporary Needs, Nathiagali, Pakistan, June 20, 1990.

\*\* "Effects of Superposed Pressure on Deformation of Metal Matrix Composites", ALCAN Kingston R&D Center, Kingston, Canada, September 24, 1990.

"Interfacial Segregation in Al Based Metal Matrix Composites", M. Strangwood, C.A. Hippsley, and J.J. Lewandowski, Fall Meeting TMS-AIME, Detroit, MI., October 9, 1990.

"Influence of Superimposed Hydrostatic Pressure on Micromechanisms of Failure in Aluminum Matrix Composite Materials", R. Margevicius and J.J. Lewandowski, Fall Meeting TMS-AIME, Detroit, MI, October 10, 1990.

"Low Cycle Fatigue Behavior of Aluminum Alloy Matrix Composites", Fall Meeting TMS-AIME, Detroit, MI, October 10, 1990.

"Fracture Behavior of Aluminum/Aluminum Matrix Composite Laminates", L. Yost Ellis and J.J. Lewandowski, Fall Meeting TMS-AIME, Detroit, MI, October 10, 1990.

"Comparative Study of the Fracture Properties of Two Aluminum Composites", M. Manoharan and J.J. Lewandowski, Fall Meeting TMS-AIME, Detroit, MI, October 10, 1990.

"Processing and Characterization of Nickel Aluminide Composites," J.D. Rigney and J.J. Lewandowski, Fall Meeting, TMS-AIME, Detroit, MI, October 10, 1990.

"Fracture Toughness of Monolithic and Composite Nickel Aluminides", J.D. Rigney and J.J. Lewandowski, Fall Meeting, TMS-AIME, Detroit, MI, October 11, 1990.

\*\* "Microstructure Effects on Deformation and Fracture of MMC's", Second Int'l Ceramic Science and Technology Congress, Orlando, FL, November 13, 1990.

"Ductile Phase Toughening of Silicides", J.D. Rigney and J.J. Lewandowski, Second Int'l. Ceramic Science and Technology Congress, Orlando, FL, November 13, 1990.

"Laminated Composites with Improved Toughness", L. Yost Ellis and J.J. Lewandowski, Second Int'l. Ceramic Science and Technology Congress, Orlando, FL, November 14, 1990.

"Fracture Toughness and Effects of Stress State on Fracture of Aluminides", J.J. Lewandowski and J.D. Rigney, MRS Meeting, Boston, MA, November 19, 1990.

"Loading Rate Effects on Ductile Phase Toughening of Silicides", J.D. Rigney, J.J. Lewandowski, M. Mendiratta, and D. Dimiduk, MRS Meeting, Boston, MA, November 30, 1990.

## **1991**

"Low Cycle Fatigue Behavior of 2014 and 2014 + Al<sub>2</sub>O<sub>3</sub> Composites", C. Liu and J.J. Lewandowski, Engineering Foundation Conference on Mechanical Fatigue of Advanced Materials, Santa Barbara, CA, January 17, 1991.

- \*\* "Effects of Stress State on Deformation and Fracture of MMC's", J.J. Lewandowski, High Temperature Materials Workshop, Wright Patterson Air Force Base, Dayton, OH, February 12-13, 1991.
- \*\* "Issues in Ductile Phase Toughening in the Nb-Nb Silicide System", J.J. Lewandowski, High Temperature Materials Workshop, Wright Patterson Air Force Base, Dayton, OH, February 12-13, 1991.
- "Low Cycle Fatigue Behavior of Aluminum Alloy Matrix Composites", C. Liu and J.J. Lewandowski, TMS-AIME Meeting, New Orleans, LA, February 19, 1991.
- \*\* "High Pressure Studies on Deformation and Fracture of Particulate Composites", J.J. Lewandowski, Department of Civil Engineering, Case Western Reserve University, Cleveland, OH, April 12, 1991.
- "Effects of Superposed Hydrostatic Stress on the Elastoplastic Behavior of Two-Phase Composites", H. Luo, R. Ballarini, and J.J. Lewandowski, ASME Applied Mechanics Conference, Columbus, OH, June 16-19, 1991.
- "Ductile Phase Toughening of Silicides", J.D. Rigney and J.J. Lewandowski, ICCM-VIII, Honolulu, HI, July 15-19, 1991.
- \*\* "Effects of High Pressure on Deformation and Fracture of Intermetallics and MMC's", J.J. Lewandowski, ICCM-VIII, Honolulu, HI, July 17, 1991.
- \*\* "Deformation and Fracture of MMCs", J.J. Lewandowski, DSIRO, Auckland, New Zealand, July 22, 1991.
- \*\* "Effects of High Pressure on Deformation and Fracture of Intermetallics and MMC's", J.J. Lewandowski, Department of Earth Sciences, Australian National University, Canberra, Australia, July 26, 1991.
- \*\* "Overview of Deformation and Fracture in MMCs", J.J. Lewandowski, Aeronautical Research Laboratory - Aircraft Materials Division, DSTO, Melbourne, Australia, July 29, 1991.
- \*\* "Overview of Deformation and Fracture in MMCs", J.J. Lewandowski, Dept. of Materials Science & Engineering, Monash University, Melbourne, Australia, July 29, 1991.
- \*\* "Pb-Induced Cracking in Al-Mg-Si Alloys", J.J. Lewandowski, ABB Components, Ludvika, Sweden, August 22, 1991.
- \*\* "Effects of Microstructure and Interfaces on Fracture of Laminated MMCs", J.J. Lewandowski, ARO Workshop on MMCs, Research Triangle Park, NC, August 25-27, 1991.
- "Residual Stresses in Aluminum Alloy Matrix Composites", C. Liu, J.J. Lewandowski, and G.M. Michal, TMS-AIME Meeting, Cincinnati, OH, October 21, 1991.
- "Processing and Properties of AZ91 Magnesium Matrix Reinforced with Silicon Carbide Particulate", G. Rozak, J.J. Lewandowski, and J.F. Wallace, TMS-AIME Meeting, Cincinnati, OH, October 21, 1991.

"Environmental Sensitive Fracture of Al-Based Metal Matrix Composites", P.M. Singh and J.J. Lewandowski, TMS-AIME Meeting, Cincinnati, OH, October 21, 1991.

"Laminated Composites with Improved Toughness", L. Ellis, T. Osman, and J.J. Lewandowski, TMS-AIME Meeting, Cincinnati, OH, October 21, 1991.

"The Effect of Stress State on the Mechanical Behavior of NiAl", R.W. Margevicius and J.J. Lewandowski, TMS-AIME Meeting, Cincinnati, OH, October 23, 1991.

\*\* "Effects of Hydrostatic Pressure on the Deformation and Fracture of Brittle Materials", J.J. Lewandowski, TMS-AIME Meeting, Cincinnati, OH, October 23, 1991.

"Monte-Carlo Simulation of Lead-Induced Slow Crack Growth in Al-Mg-Si Alloys", P.M. Singh, N.J.H. Holroyd, J.J. Lewandowski, and J.T. Evans, TMS-AIME Mtg., Cincinnati, OH, October 23, 1991.

"Processing and Properties of Nb<sub>5</sub>Si<sub>3</sub>/Nb Composites", J. Kajuch and J.J. Lewandowski, TMS-AIME Meeting, Cincinnati, OH, October 23, 1991.

"Volume Fraction Effects on Ductile-Phase Toughening in *in-situ* Niobium-Niobium Silicide Composites", J.D. Rigney and J.J. Lewandowski, TMS-AIME Meeting, Cincinnati, OH, October 23, 1991.

"Effects of Carbon Additions in the Mechanical Behavior of MoSi<sub>2</sub>", S.A. Maloy, A.H. Heuer, J.J. Lewandowski, and J. Petrovic, TMS-AIME Meeting, Cincinnati, OH, October 24, 1991.

\*\* "Processing and Properties of Silicide Composites", J.J. Lewandowski, J.D. Rigney, and J. Kajuch, Workshop on Silicides, Gaithersburg, VA, November 4, 1991.

\*\* "Effects of Carbon Additions on MoSi<sub>2</sub>", S.A. Maloy, J.J. Lewandowski, A.H. Heuer, and J.J. Petrovic, Workshop on Silicides, Gaithersburg, VA, November 4, 1991.

## **1992**

\*\* "Mechanical Testing Techniques for Composite Materials", J. J. Lewandowski, BP America, Warrensville Research Lab, Cleveland, OH, February 7, 1992.

\*\* "Effects of Pressure on Deformation and Fracture of NiAl", J. J. Lewandowski, NASA Lewis Research Center, Cleveland, OH, February 26, 1992.

"Environmental Effects on Fracture of Nb<sub>5</sub>Si<sub>3</sub>/Nb Composites", J. D. Rigney, P. M. Singh, and J. J. Lewandowski, TMS-AIME Meeting, San Diego, CA, March 1-4, 1992.

"Effects of Pressure on Processing and Properties of Advanced Materials", A. L. Grow, S. Patankar, T. Osman, Y. Esmaeilpour, and J. J. Lewandowski, TMS-AIME Meeting, San Diego, CA, March 1-3, 1992.

\*\* "Processing and Properties of Tough Silicides", J.J. Lewandowski, WRDC Workshop on High Temperature Materials, Dayton, OH, April 19, 1992.

\*\* "Metal Matrix Composites Research at CMSS", J.J. Lewandowski, NASA-CCDS Annual Review, Cleveland, OH, May 13, 1992.

- \*\*"Structural Evolution and Property Enhancement by Advanced Processing of Dissimilar Materials", J.J. Lewandowski, NSF Workshop on Advanced Materials, Washington, D.C., May 14, 1992.
- \*\*"Processing of Advanced Materials", J.J. Lewandowski, AFOSR/ONR Workshop on Processing, Aurora, NY, May 18, 1992.
- \*\*"Microstructural Effects on Micromechanisms of Fracture in Advanced Metallic Materials", J.J. Lewandowski, Gordon Conference on Physical Metallurgy, Plymouth, NH, June 15, 1992.
- \*\*"Pressure Effects on Interfaces", J.J. Lewandowski, Los Alamos National Lab Workshop on Interfaces, Los Alamos, NM, August 4, 1992.
- \*\*"The Ductile to Brittle Transition in MoSi<sub>2</sub>", J.J. Lewandowski, Los Alamos National Lab Workshop on MoSi<sub>2</sub>, Los Alamos, NM, August 10, 1992.
- \*\*"Advanced Processing of Intermetallics", J.J. Lewandowski, Workshop on Advanced Processing of Titanium Aluminides", AGA Company, Cleveland, OH, August 12, 1992.
- "Aspects of Ductile Phase Toughening in *In-situ* Composites", J.D. Rigney, J. Kajuch, and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 2, 1992.
- "Processing and Properties of Tough Laminated Composites", T. Osman, W. Hunt, Jr., and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 2, 1992.
- "Non-Destructive Evaluation of Interface Strength", J. Zhang and J. J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 2, 1992.
- "Pressure-Induced Dislocations and Subsequent Flow in NiAl", R.W. Margevicius and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 2, 1992.
- "Pressure-Induced Ductility in NiAl", R.W. Margevicius and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 2, 1992.
- "A High Temperature-High Pressure Deformation and Processing Apparatus", P. Harwood, M. Costantino, and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 3, 1992.
- "Kinetic Model for Formation of Nb<sub>5</sub>Si<sub>3</sub>", J. Short, J. Kajuch, and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 3, 1992.
- "Dislocations and Flow in Single Crystal MoSi<sub>2</sub>", S. Maloy, T.E. Mitchell, J.J. Lewandowski, and A. H. Heuer, TMS-AIME Meeting, Chicago, IL, November 3, 1992.
- \*\*"Modelling of Impurity Induced Slow Crack Growth in Aluminum Alloys", J.J. Lewandowski, Jaffee Memorial Symposium on Clean Materials Technology, Chicago, IL, November 4, 1992.
- "Effects of Casting Condition and Hot Deformation Processing on A356 and A356-SiC Composites", G. Rozak, J. J. Lewandowski, and J.F. Wallace, TMS-AIME Meeting, Chicago, IL, November 5, 1992.

"Effects of Interface Modification on Interface Strengths of Laminates", J. Zhang and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 5, 1992.

"Hydrostatic Extrusion of 2014 and 6061 Composites", S. Patankar, R.W. Margevicius, and J.J. Lewandowski, TMS-AIME Meeting, Chicago, IL, November 5, 1992.

"Processing and Properties of MoSi<sub>2</sub>", S. Patankar and J.J. Lewandowski, MRS Meeting, Boston, MA, November 30, 1992.

"Ductile Phase Toughened Silicides", J.D. Rigney, J. Kajuch, and J.J. Lewandowski, MRS Meeting, Boston, MA, November 30, 1992.

"Effects of Pressure on Flow and Fracture of NiAl", R.W. Margevicius, I. Locci, and J.J. Lewandowski, MRS Meeting, Boston, MA, November 30, 1992.

"Kinetic Model for Nb<sub>5</sub>Si<sub>3</sub> Formation", J. Kajuch and J.J. Lewandowski, MRS Meeting, Boston, MA, November 30, 1992.

### **1993**

"Kinetic Model for Nb<sub>5</sub>Si<sub>3</sub> Formation", J. Short, J. Kajuch, C. Liu, and J. J. Lewandowski, TMS-AIME Meeting, Denver, CO, February 22, 1993.

"Processing and Properties of Nb<sub>5</sub>Si<sub>3</sub>/Nb Laminates", J. D. Rigney, J. Kajuch, and J. J. Lewandowski, TMS-AIME Meeting, Denver, CO, February 22, 1993.

"Hybrid Composites for Aerospace Applications", T. M. Osman, W. Hunt, Jr., R. Bucci, and J. J. Lewandowski, TMS-AIME Meeting, Denver, CO, February 22, 1993.

"Effects of Interface Modification on Aluminum Alloy/DRA Laminates", L. Y. Ellis, T. M. Osman, and J. J. Lewandowski, TMS-AIME Meeting, Denver, Co, February 22, 1993.

"Layer Thickness Effects on Laminated Composites", T. M. Osman, L. Y. Ellis, W. H. Hunt, Jr., and J. J. Lewandowski, TMS-AIME Meeting, Denver, CO, February 22, 1993.

"Effects of Confining Pressure on Fracture of CP-Mg", P. Harwood, M. Beeman, G. Rozak, and J. J. Lewandowski, TMS-AIME Meeting, Denver, CO, February 22, 1993.

"Effects of Confining Pressure on Fracture of AZ91 and AZ91 Composites", P. Harwood, M. Beeman, G. Rozak, and J. J. Lewandowski, TMS-AIME Mtg, Denver, CO, February 22, 1993.

"Evolution of Residual Stresses in MMCs", C. Liu, G. M. Michal, and J. J. Lewandowski, TMS-AIME Meeting, Denver, CO, February 24, 1993.

"Processing and Properties of A356/20% SiC<sub>p</sub> Composites", G. Rozak, J. J. Lewandowski, and J. F. Wallace, SAE Meeting, Detroit, MI, March 1, 1993.

\*\* "Issues in Processing and Properties of MMCs", ALCOA Technical Center, Pittsburgh, PA, March 1, 1993.

\*\* "Issues in the Processing and Properties of Aluminum Alloys and MMCs", DOE Workshop, Clearwater, FL, May 4, 1993.

- \*\* "Ductile Phase Toughening of Brittle Materials", Wright Research and Development Center, Dayton, OH, May 12, 1993.
- \*\* "Optimizing the Properties of Al and Mg-Based MMCs", NASA CCDS Annual Review, Cleveland, OH, May 25, 1993.
- "Effects of Stress State on Fracture of AZ91D Composites", G. Rozak, P. Harwood, M. Beeman, and J. J. Lewandowski, NASA CCDS Annual Review, Cleveland, OH, May 25, 1993.
- "Processing and Properties of AZ91D MMCs", G. Rozak, J. J. Lewandowski, and J. F. Wallace, NASA CCDS Annual Review, Cleveland, OH, May 25, 1993.
- "Effects of Processing and Stress State of Laminated Materials", NSF-PYI Workshop, University California San Diego Institute of Mechanics and Materials, San Diego, CA, July 5, 1993.
- "Processing and Properties of MMCs", J. J. Lewandowski, ICCM-9, Madrid, Spain, July 12-16, 1993.
- \*\* "Opportunities in Processing and Properties of MMCs", J. J. Lewandowski, Department of Civil Engineering and Materials, Universidad de Cantabria, Santander, Spain, July 23, 1993.
- "Effects of Processing on Properties of MoSi<sub>2</sub>", D. Hardwick, P. Martin, S. Patankar, and J. J. Lewandowski, ISSI-I, Seven Springs, PA, September 26, 1993.
- "Effects of Pressure on Flow and Fracture of NiAl", R. W. Margevicius, J. J. Lewandowski, and I. Locci, ISSI-I, Seven Springs, PA, September 26, 1993.
- \*\* "Microstructural Effects on Mechanical Behavior of *In-Situ* Composites", J. J. Lewandowski, TMS-AIME Fall Meeting, Pittsburgh, PA, October 19, 1993.
- \*\* "Fracture Toughness of Intermetallics and Intermetallic Composites", J. D. Rigney and J. J. Lewandowski, TMS-AIME Fall Meeting, Pittsburgh, PA, October 19, 1993.
- "Effects of Heat Treatment and Reinforcement Size on Reinforcement Fracture During Tension Testing of a SiC<sub>p</sub> Discontinuously Reinforced Aluminum Alloy", P. Singh and J. J. Lewandowski, TMS-AIME Fall Meeting, Pittsburgh, PA, October 18, 1993.
- "Effects of Reinforcement Size on The High Cycle Fatigue Behavior of Mg-Based MMCs", A. Vaidya and J. J. Lewandowski, TMS-AIME Fall Meeting, Pittsburgh, PA, October 18, 1993.
- "Effects of Laminate Thickness on Nb<sub>5</sub>Si<sub>3</sub>/Nb Composites", J. Short, J. Kajuch, and J. J. Lewandowski, TMS-AIME Fall Meeting, Pittsburgh, PA, October 18, 1993.
- "New Techniques in Processing of Discontinuously Reinforced Aluminum DRA Composites", E. J. Hilinski, J. J. Lewandowski, T. J. Rodjom, and P. T. Wang, TMS-AIME Fall Meeting, Pittsburgh, PA, October 18, 1993.
- "Influence of Hydrostatic Extrusion on the Tensile Properties of Discontinuously Reinforced Aluminum", A. L. Grow, S. Patankar, and J. J. Lewandowski, TMS-AIME Fall Meeting, Pittsburgh, PA, October 20, 1993.

\*\* "Effects of Stress State on Deformation and Fracture", J.J. Lewandowski, Case Western Reserve University, Cleveland, OH, November 15, 1993.

"The Temperature and Strain Rate Dependence of the Flow Stress in MoSi<sub>2</sub> Single Crystals", S.A. Maloy, T.E. Mitchell, A.H. Heuer, J.J. Lewandowski, MRS Fall Meeting, Boston, MA, November 29, 1993.

"Environmental Effects on Fracture of *In-Situ* Nb<sub>5</sub>Si<sub>3</sub>/Nb Composites", J.D. Rigney, P.M. Singh, and J.J. Lewandowski, MRS Fall Meeting, Boston, MA, December 2, 1993.

## **1994**

\*\* "Factors Affecting Damage Evolution in Commercially Produced MMCs", J.J. Lewandowski, 6th Annual MMC Working Group, Park City, UT, February 1, 1994.

\*\* "Properties and Behavior of Laminated MMCs", 6th Annual MMC Working Group, Park City, UT, February 1, 1994.

\*\* "Effects of Pressure on Deformation and Fracture of Advanced Materials", J.J. Lewandowski, Department of Mechanical Engineering, Johns Hopkins University, February, 25, 1994.

\*\* "Cyclic Work Hardening Behavior of Discontinuously Reinforced Aluminum Alloys", J.J. Lewandowski, TMS-AIME Annual Meeting, San Francisco, CA, March 1, 1994.

"Processing and Properties of Nb<sub>5</sub>Si<sub>3</sub>/Nb Laminates", J.W. Short, J. Kajuch, and J.J. Lewandowski, MRS Spring Meeting, San Francisco, CA, April 6, 1994.

\*\* "Effects of Pressure on Deformation and Fracture of Advanced Materials", J.J. Lewandowski, Department of Mechanical Engineering, University of Akron, April 29, 1994.

"Development of a Densification Model for DRA", E.J. Hilinski, J.J. Lewandowski, T.J. Rodjom, P.T. Wang, International Conf. on Powder Metallurgy, Toronto, Canada, May 9, 1994.

"Flow Behavior and Stress Evolution Modeling for DRA Composites", E.J. Hilinski, J.J. Lewandowski, T.J. Rodjom, P.T. Wang, Int'l. Conf. on Powder Metallurgy, Toronto, May 9, 1994.

"Laminated MMCs with Improved Properties", T.M. Osman, J.J. Lewandowski, and W.H. Hunt, Jr., International Conf. on Powder Metallurgy, Toronto, Canada, May 9, 1994.

"Laminated MMCs with High Toughness", T.M. Osman and J.J. Lewandowski, AEROMAT, Los Angeles, CA, June 7, 1994.

\*\* "Advanced Lightweight Composite Materials", J.J. Lewandowski, OAI Educational Lecture, Cleveland, OH, June 24, 1994.

\*\* "Processing and Properties of Laminated Materials with High Toughness", J.J. Lewandowski, GE-CRD Lab, Schenectady, NY, July 18, 1994.

"DRA Laminates with Improved Performance", T.M. Osman, J.J. Lewandowski, C. Syn, D. Leseur, and W.H. Hunt, Jr., Fourth Int'l Conf. on Al. Alloys, Atlanta, GA, September 14, 1994.

"Factors Affecting Toughness in Brittle Materials", J.J. Lewandowski, TMS-AIME Fall Meeting, Rosemont, IL, October 5, 1994.

\*\* "Effects of SiCp Reinforcement Size on Strength, Ductility, and High Cycle Fatigue of AZ91D Mg", J.J. Lewandowski, Ford Motor Company, Dearborn, MI, October 13, 1994.

\*\* "Microstructural Effects on Deformation and Fracture of Layered Materials", J.J. Lewandowski, Department of Materials Science and Eng., University of Michigan, Ann Arbor, MI, October 14, 1994.

\*\* "Fracture of Refractory Metal Intermetallic Matrix Composites", J.J. Lewandowski, Wright State University, Dayton, OH, October 20, 1994.

## **1995**

"Hydrogen Embrittlement", J.J. Lewandowski, IMF Educational Day, Harmarville, PA, January 26, 1995.

\*\* "Damage Evolution in DRA Materials", P.M. Singh and J.J. Lewandowski, TMS Annual Meeting, Las Vegas, NV, February 13, 1995.

\*\* "Factors Affecting the Toughness of Extrinsicly Toughened Materials", J.J. Lewandowski, J. Short and J.D. Rigney, TMS Annual Meeting, Las Vegas, NV, February 13, 1995.

"Extrinsic Toughening of Porous Steels", P. Lowhaphandu, J.J. Lewandowski, and J.D. Rigney, TMS Annual Meeting, Las Vegas, NV, February 13, 1995.

"Toughness of DRA/Aluminum Alloy Laminates", T.M. Osman, J.J. Lewandowski, D. Leseur, C.K. Syn, and R. Riddle, TMS Annual Meeting, Las Vegas, NV, February 13, 1995.

\*\* "Laminated DRA with High Toughness", J.J. Lewandowski, National Physical Laboratory, New Delhi, India, March 1, 1995.

"Effects of SiCp Reinforcement Size on Hydrostatic Extrusion of MMC's", A.L. Grow and J.J. Lewandowski, SAE Meeting, Detroit, MI, March 6, 1995.

\*\* "Processing and Properties of Laminated DRA", J.J. Lewandowski, Workshop on MMCs, IIS Bangalore, India, March 7, 1995.

\*\* "Advanced Deformation and Fracture Tools", J.J. Lewandowski, CWRU Research Day, Case Western Reserve University, Cleveland, OH, April 28, 1995.

"DRA Laminates with High Toughness", W.H. Hunt, Jr., J. Teply, R. Bush, T. Osman, and J.J. Lewandowski, AEROMAT 1995, Anaheim, CA, May 11, 1995.

\*\* "Advanced Lightweight Structural Materials", J.J. Lewandowski, Alliance Machine Co., Alliance, OH, June 14, 1995.

\*\* "Advanced Deformation and Fracture Tools in Analysis of Advanced Materials", J.J. Lewandowski, OAI/NASA, Cleveland, OH, June 16, 1995.

- "Toughness Enhancement in DRA for Aircraft Structural Applications", J.J. Lewandowski, OAI Interim Review, OAI, Cleveland, OH, July 12, 1995.
- "Layered DRA Produced via Spray Deposition", E.J. Lavernia, M. Wu, J.J. Lewandowski, and W.H. Hunt, Jr., Engineering Foundation Conference on Layered Materials, Davos, Switzerland, August 22, 1995.
- "Laminated DRA Systems with High Toughness", D. Leseur, B. Riddle, J.J. Lewandowski, and W.H. Hunt, Jr., Engineering Foundation Conference on Layered Materials, Davos, Switzerland, August 22, 1995.
- \*\* "Fracture and Fatigue Behavior of Toughened High Temperature Structural Materials", J.J. Lewandowski, NATO Workshop, Sesimbra, Portugal, September 21, 1995.
- \*\* "Microstructure and Stress State Effects on Fracture of Composites", J.J. Lewandowski, Department of Materials Science and Engineering, University of Cincinnati, Cincinnati, OH, October 13, 1995.
- "Deformation and Fracture of DRA Laminates", T.M. Osman, J.J. Lewandowski, D.R. Leseur, C.K. Syn, and R.A. Riddle, and J.J. Lewandowski, TMS-AIME Fall Meeting, Cleveland, OH, October 30, 1995.
- "Yield Point Behavior in NiAl", R.W. Margevicius and J.J. Lewandowski, TMS-AIME Fall Meeting, Cleveland, OH, October 30, 1995.
- "Effects of Test Temperature and Nb Layer Thickness on Fracture Behavior and Toughness of Nb<sub>5</sub>Si<sub>3</sub>/Nb Laminates", J. Short, J. Kajuch, and J.J. Lewandowski, TMS-AIME Fall Meeting, Cleveland, OH, October 30, 1995.
- \*\* "Microstructural Effects on the Toughness of High Temperature Materials", J.J. Lewandowski, TMS-AIME Fall Meeting, Cleveland, OH, October 30, 1995.
- "Environmental Effects on the Mechanical Properties of DRA Alloys", P.M. Singh and J.J. Lewandowski, TMS-AIME Fall Meeting, Cleveland, OH, Nov. 1, 1995.
- "A Densification and Flow Stress Evolution Constitutive Model for Powder Based DRA Materials", E.J. Hilinski, J.J. Lewandowski, and P.T. Wang, TMS-AIME Fall Meeting, Cleveland, OH, November 2, 1995.
- "Effects of Ductile Phase Toughening on the Fracture Behavior of Al/SiCp Composites", L. Ellis, J.J. Lewandowski, and W.H. Hunt, Jr., TMS-AIME Fall Meeting, Cleveland, OH, November 2, 1995.
- "Extrinsic Toughening of P/M Plain Carbon Steels by Copper Infiltration", P. Lowhaphandu and J.J. Lewandowski, TMS-AIME Fall Meeting, Cleveland, OH, November 2, 1995.
- \*\* "Aluminum MMC's- Research Programs, Issues and Future Directions", J.J. Lewandowski, OAI Workshop, Cleveland, OH, November 2, 1995.
- \*\* "Toughening of Brittle and Semi-Brittle Materials", J.J. Lewandowski, Materials Science Lecture Series, California Institute of Technology, Pasadena, CA, December 6, 1995.

\*\* "Fatigue and Fracture Behavior of Toughened High Temperature Structural Materials", J.J. Lewandowski, Japan Institute of Metals, Honolulu, Hawaii, December 14, 1995.

\*\* "Laminated Metal Composites with High Strength and Toughness", J.J. Lewandowski, Japan Institute of Metals, Honolulu, Hawaii, December 15, 1995.

## **1996**

\*\* "Interface Effects on Fracture of DRA and DRA Laminates", J.J. Lewandowski, International Conference on Microscopy of Interfaces in MMCs, Oxford University, U.K., April 1, 1996.

\*\* "Laminated Metal Composites-Fracture Toughness and Impact Properties", D.R. Leseur, J. Wadsworth, R.A. Riddle, C.K. Syn, J.J. Lewandowski, and W.H. Hunt, Jr., Spring MRS Meeting, San Francisco, CA, April 10, 1996.

"Fracture and Fatigue Behavior of Toughened DRA", L.Y. Ellis, D.S. Liu, J.J. Lewandowski, and W.H. Hunt, Jr., Spring MRS Meeting, San Francisco, CA, April 10, 1996.

\*\* "Microstructure and Stress State Effects on Fracture of Composite Materials", J.J. Lewandowski, Department of Materials Science and Engineering Seminar, University of Pittsburgh, Pittsburgh, PA, May 9, 1996.

\*\* "Microstructure and Stress State Effects on Fracture of Composite Materials", J.J. Lewandowski, Department of Materials Science and Engineering Seminar, University of Virginia, Charlottesville, VA, May 16, 1996.

\*\* "Microstructure Effects on Fracture Toughness of DRA", J.J. Lewandowski, AEROMAT Conference, Dayton, OH, June 6, 1996.

"Effects of Stress State on Deformation and Fracture of Structural Materials", J.J. Lewandowski, ASME Mechanics and Materials Conference, Baltimore, MD, June 14, 1996.

" Processing and Properties of Toughened DRA", J.J. Lewandowski, OAI Final Review, Cleveland, OH, July 16, 1996.

\*\* "Processing and Property Studies on Advanced Materials", J.J. Lewandowski, TOSO SMD, Inc., Grove City, OH, July 19, 1996.

"Fracture and Fatigue of Toughened DRA", J.J. Lewandowski, ALCOA Technical Center, ALCOA Center, PA, July 25, 1996.

\*\* "Fatigue and Fracture of Toughened Materials", J.J. Lewandowski, AFOSR Workshop on High Temperature Structural Materials, Bar Harbor, MA, August 21, 1996.

\*\* "Fatigue and Fracture of Toughened Materials", J.J. Lewandowski, TMS Fall Meeting, Cincinnati, OH, October 7, 1996.

"Effects of Superimposed Pressure on Fracture of Structural Materials", P. Lowhaphandu and J. J. Lewandowski, TMS Fall Meeting, Cincinnati, OH, October 7, 1996.

"Fatigue of NbSi *In-Situ* Composites", W. Zinsser and J.J. Lewandowski, TMS Fall Meeting

Cincinnati, OH, October 7, 1996.

\*\* "Effects of Interfaces on Fracture of Layered Materials", J.J. Lewandowski, TMS Fall Meeting, Cincinnati, OH, October 9, 1996.

\*\* "Materials and Mechanics Issues in Heterogeneous Systems", J.J. Lewandowski, Boeing Commercial Aircraft, Seattle, WA, October 10, 1996.

\*\* "Fracture and Fatigue of Structural Materials", J.J. Lewandowski, Biomechanics Group, Case Western Reserve University, Cleveland, OH, October 30, 1996.

\*\* "Effects of Bonding Conditions on Mechanical Behavior of Laminates", J.J. Lewandowski, International Conference on Advances in Welding/Joining Techniques, Edison Welding Institute, Columbus, OH, November 7, 1996.

### **1997**

\*\* "Toughening and Fatigue Performance of Brittle and Semi-Brittle Structural Materials", J.J. Lewandowski, TMS Annual Meeting, Orlando, FL, February 11, 1997.

"Fatigue of Monolithic Nb and Nb-based *In-situ* Composites", W.A. Zinsser and J.J. Lewandowski, TMS Annual Meeting, Orlando, FL, February 11, 1997.

"Fracture Toughness Testing of A.R.E.A. Grade B Hand Tool Steel", C.P. Lonsdale and J.J. Lewandowski, A.R.E.A. Spring Technical Conference, Chicago, IL, March 17, 1997.

\*\* "Fracture and Fatigue Behavior of Composites", J.J. Lewandowski, Naval Research Lab, Washington, D.C., May 6, 1997.

\*\* "Fracture and Fatigue of DRA and Toughened DRA", J.J. Lewandowski, AEROMAT, Williamsburg, VA, May 13, 1997.

\*\* "Deformation Processing Issues Using Hydrostatic Extrusion for the Production of Intermetallics and Composites with Improved Performance", J.J. Lewandowski, ONR Materials Science Review, Woods Hole, MA, June 16, 1997.

\*\* "Fracture Toughness and Fatigue of Bulk Metallic Glass", J.J. Lewandowski, ATI, Inc., Laguna Niguel, CA, June 19, 1997.

\*\* "Fracture Toughness and Fatigue of Bulk Metallic Glass", J.J. Lewandowski, Department of Matl's Sci. and Engineering, California Institute of Technology, Pasadena, CA, June 20, 1997.

\*\* "DRA: Strength, Ductility, Toughness and Fatigue Behavior", J.J. Lewandowski, Triton Systems, Inc., Chelmsford, MA, August 14, 1997.

"Deformation and Fracture of Bulk Metallic Glass", P. Lowhaphandu, L. Ludrosky, and J.J. Lewandowski, TMS-AIME Fall Meeting, Indianapolis, IN, September 15, 1997.

"Effects of Changes in Grain Size and R-Ratio on Fatigue of Monolithic Nb and Nb-Based *In-situ* Composites", W.A. Zinsser and J.J. Lewandowski, TMS-AIME Fall Meeting, Indianapolis,

IN, September 17, 1997.

"Effects of Changes in Frequency and R-ratio on Fatigue of Refractory Metal Intermetallic Composites", W.A. Zinsser and J.J. Lewandowski, ISSI-II, Seven Springs, PA, September 22, 1997.

"Fracture Toughness Testing of Thermite Welds in Rail Steel", C.P. Lonsdale and J.J. Lewandowski, International Symposium on Rail Steels, Indianapolis, IN, October 21, 1997.

## **1998**

"Effects of Annealing Treatments on Strength and Toughness of a Bulk Amorphous Metal", L. Ludrosky, P. Lowhaphandu, and J.J. Lewandowski, TMS-AIME Annual Meeting, San Antonio, TX, February 17, 1998.

"Effects of Rolling Temperature and Reduction on Microstructure and Tensile Properties of P/M Mo", S.A. Zwonitzer, G.A. Rozak, and J.J. Lewandowski, TMS-AIME Annual Meeting, San Antonio, TX, February 18, 1998.

\*\* "Microstructure Effects on Fatigue", J.J. Lewandowski, ASM Milwaukee Chapter Fatigue Symposium, Milwaukee, WI, April 22, 1998.

\*\* "Surface Analysis of B<sub>4</sub>C", J.J. Lewandowski, ALYN Corp., Irvine, CA, May 13, 1998

\*\* "Mechanical Behavior of Materials", J.J. Lewandowski, CWRU Reunion Day, Cleveland, OH, June 6, 1998

\*\* "Fracture and Fatigue of Nb-Based Intermetallic Composites", J.J. Lewandowski, WPAFB, Dayton, OH, July 15, 1998.

\*\* "Fracture of Bulk Metallic Glass", J.J. Lewandowski, WPAFB, Dayton, OH, July 15, 1998.

\*\* "Mechanical Behavior of Nb-Si In-Situ Composites", J.J. Lewandowski, S. Solv'yev, and W.A. Zinsser, TMS-ASM Fall Meeting, Rosemont, IL, October 12, 1998.

\*\* "Evolving Research and Development Directions in DRA", J.J. Lewandowski, ASM Materials Week, Rosemont, IL, October 12, 1998.

\*\* "Effects of 6013 Layer Volume Fraction and Thickness on Fracture of 6013/6090/SiC/25p Laminates", J.D. Rigney, R.W. Bush, J. Teply, J.J. Lewandowski, C.K. Syn, and D.R. Lesuer, TMS-ASM Fall Meeting, Rosemont, IL, October 12, 1998.

"Effects of Annealing Treatment on the Mechanical Behavior of Bulk Zr-Ti-Ni-Cu-Be", P. Lowhaphandu, L. Ludrosky, and J.J. Lewandowski, TMS-ASM Fall Meeting, Rosemont, IL October 12, 1998.

"Effects of Stress Triaxiality on the Damage Evolution of Discontinuously Reinforced Composites", P. Lowhaphandu and J.J. Lewandowski, TMS-ASM Fall Meeting, Rosemont, IL October 14, 1998.

\*\* "Factors Affecting the Toughness of Composites", J.J. Lewandowski, TMS-AMS Fall Meeting, Rosemont, IL, October 14, 1998.

"Effects of Particle Morphology and Type on Fracture and Fatigue of DRA", J. Oviedo and J.J. Lewandowski, TMS-ASM Fall Meeting, Rosemont, IL, October 14, 1998.

"Annealing Effects on Mechanical Behavior of Bulk Metallic Glass", S. Montgomery, P. Lowhaphandu, L. Ludrosky and J.J. Lewandowski, TMS-ASM Fall Meeting, Rosemont, IL, October 14, 1998.

"Fracture and Fatigue of Refractory Metal Intermetallic Composites", S. Solv'yev, W. Zinsser, and J.J. Lewandowski, MRS Fall Meeting, Boston, MA, December 2, 1998.

\*\* "Fracture and Fatigue of Refractory Metal Intermetallic Composites", J.J. Lewandowski, U.S.-Japan Workshop on Very High Temperature Structural Materials, Honolulu, HI, December 9, 1998.

## **1999**

\*\* "Fracture and Fatigue of Refractory Metal Intermetallic Composites", J.J. Lewandowski, AFOSR Workshop, San Diego, CA, March 4, 1999.

\*\* "Casting Activities at CWRU", J.J. Lewandowski, NSF Workshop, Washington, D.C., March 17, 1999.

\*\* "Fracture and Fatigue of Bulk Metallic Glass", J.J. Lewandowski, Howmet Technical Center, Whitehall, MI, March 31, 1999.

\*\* "Stress Corrosion Cracking of AISI 305, 410, and A325", J. Oviedo and J.J. Lewandowski, NACE Meeting, San Antonio, TX, April 24, 1999.

\*\* "Flow, Fracture, and Fatigue of Composite Materials", J.J. Lewandowski, Department of Design and Manufacturing, Ain Shams University, Cairo, Egypt, April 26, 1999.

"Structure-Property Relationships in Continuous Fiber Composites", C. Bowman and J.J. Lewandowski, NASA HI-TEMP Meeting, Cleveland, OH, May 5, 1999.

\*\* "Advanced Testing Facilities for Deformation and Fracture Experimentation", J.J. Lewandowski, NIST, Gaithersburg, MD, June 7, 1999.

"Effects of the Addition of Toughening Ligaments on the Fatigue of Composites", J.J. Lewandowski and P. Lowhaphandu, Fatigue '99, Beijing, China, June 11, 1999.

\*\* "Fracture and Fatigue of Bulk Metallic Glass", P. Lowhaphandu and J.J. Lewandowski, IUMRS-ICAM '99, Beijing, China, June 17, 1999.

\*\* "Fracture and Fatigue of Refractory Metal Intermetallic Composites", J.J. Lewandowski and P. Lowhaphandu, IUMRS-ICAM '99, Beijing, China, June 17, 1999.

\*\* "Fracture and Fatigue of Bulk Metallic Glass", J.J. Lewandowski and P. Lowhaphandu,

Workshop on Bulk Metallic Glass, Beijing, China, June 18, 1999.

\*\* "Fracture and Fatigue of Refractory Metal Intermetallic Composites", J.J. Lewandowski, AEROMAT, Dayton, OH, June 23, 1999.

\*\* "Fracture and Fatigue of DRA Composites", J.J. Lewandowski, AFOSR Composites Workshop, WPAFB, Dayton, OH, September 9, 1999.

\*\* "Deformation Processing and Simulation", J.J. Lewandowski, U.S. Steel Research Labs, Monroeville, PA, September 27, 1999.

\*\* "Microstructure and Stress State Effects on Fracture of Structural Materials", Staff Seminar, Carnegie-Mellon University, Pittsburgh, PA, September 28, 1999.

"Deformation Processing and Simulation", J.J. Lewandowski, Timken Research Lab Visit, Case Western Reserve University, Cleveland, OH, September 30, 1999.

\*\* "Deformation Processing and Simulation", J.J. Lewandowski, ALCOA Technical Center, ALCOA Center, PA, October 21, 1999.

\*\* "Deformation Processing and Simulation", J.J. Lewandowski, USAMP Meeting, CWRU, Cleveland, OH, October 28, 1999.

"Environmental Exposure Cracking Tests of AISI 305, 410 and Low Alloy Steel Bolts/Fasteners in Boiling Acidified Chloride Solutions", J.R. Oviedo and J.J. Lewandowski, TMS-AIME Fall Meeting, Cincinnati, OH, November 1, 1999.

"Fracture Resistance of Zr-Ti-Ni-Cu-Be Bulk Amorphous Alloy", P. Lowhaphandu, L.A. Ludrosky, and J.J. Lewandowski, TMS-AIME Fall Meeting, Cincinnati, OH, November 3, 1999.

"Effects of Stress Triaxiality on Flow and Fracture of a Zr-Ti-Ni-Cu-Be Bulk Amorphous Alloy", P. Lowhaphandu, L.A. Ludrosky, and J.J. Lewandowski, TMS-AIME Fall Meeting, Cincinnati, OH, November 3, 1999.

"Effects of Changes in Grain Size on Flow and Fracture of Nb and Nb-1% Zr", D. Padhi, A.V. Samant, and J.J. Lewandowski, TMS-AIME Fall Meeting, Cincinnati, OH, November 3, 1999.

"Preliminary Experiments on an Advanced Deformation Simulator Apparatus", N.S. Prabhu and J.J. Lewandowski, TMS-AIME Fall Meeting, Cincinnati, OH, November 3, 1999.

\*\* "High Pressure Effects on Flow and Fracture", J.J. Lewandowski, NASA Glenn Research Center, Cleveland, OH, November 8, 1999.

\*\* "Effects of Hydrostatic Pressure on Flow, Fracture, and Deformation Processing", J.J. Lewandowski, Department of Materials Science, Imperial College of Science and Technology, London, U.K., December 8, 1999.

\*\* "Deformation Processing and Simulation", J.J. Lewandowski, Luxfer Advanced Technology Centers Meeting, Chepstow, U.K., December 14, 1999.

"Deformation Processing and Simulation", J.J. Lewandowski, DARPA, Arlington, VA, December 22, 1999.

## **2000**

\*\* "Flow and Fracture Studies on Bulk Metallic Glass", J.J. Lewandowski, Department of Matl's Science and Engineering, Johns Hopkins University, Baltimore, MD, February 23, 2000.

"Fracture and Fatigue of Nb<sub>5</sub>Si<sub>3</sub>/Nb Composites", D. Padhi, S. Solv'yev, W. Zinsser, and J.J. Lewandowski, TMS Annual Meeting, Nashville, TN, March 15, 2000.

\*\* "Microstructural Effects on the Cleavage Fracture Stress of Pearlitic Steels", J.J. Lewandowski, TMS Annual Meeting, Nashville, TN, March 15, 2000.

"Fracture and Fatigue of Al-Be Composites", J. Larose, S. Solv'yev, R. Castro, and J.J. Lewandowski, TMS Annual Meeting, Nashville, TN, March 15, 2000.

"Densification and Flow Stress Evolution Processing Model for DRA", E. Hilinski, T.J. Rodjom, P.T. Wang, J.J. Lewandowski, TMS Annual Meeting, Nashville, TN, March 15, 2000.

"Pressure Effects on Flow and Fracture of Monolithic and Composite Materials", P. Lowhaphandu and J.J. Lewandowski, TMS Annual Meeting, Nashville, TN, March 15, 2000.

"Dynamic Deformation and Fracture Behavior of Novel Damage Tolerant DRA Composite Materials", M. Irfan, V. Prakash, and J.J. Lewandowski, TMS Annual Meeting, Nashville, TN, March 15, 2000.

"Environment-Assisted Cracking of AISI 305, 410 SS, and Low Alloy Steel ASTM A-325 Bolts/Fasteners in Chloride Containing Solutions", J.R. Oviedo, J.J. Lewandowski, and J.H. Payer, NACE Meeting, Orlando, FL, March 29, 2000.

\*\* "Fracture and Fatigue of Refractory Metal Composites", J.J. Lewandowski, Instituto Militar de Engenharia – Department of Engineering Mechanics and Materials, Rio de Janeiro, Brazil, May 10, 2000.

\*\* "Fracture and Fatigue of Al-Be Composites", J.J. Lewandowski, ONR Program Review, Woods Hole, MA, May 24, 2000.

"Pressure Effects on Flow and Fracture of Al-Be Composites and Other Structural Materials", J. Larose and J.J. Lewandowski, 2000 Physical Metallurgy Gordon Conference, Plymouth, NH, July 26, 2000.

"Processing and Microstructure Effects on Flow/Fracture of Nb and Nb Alloys", D. Padhi and J.J. Lewandowski, 2000 Physical Metallurgy Gordon Conference, Plymouth, NH, July 26, 2000.

"Unique Forging Simulation Equipment for Evaluation of Flow Stress, Microstructure Evolution, and Resulting Properties of Deformation Processed Materials," N. Prabhu and J.J. Lewandowski, 2000 Physical Metallurgy Gordon Conference, Plymouth, NH, July 26, 2000.

\*\* "Effects of Annealing and Changes in Stress State on Flow and Fracture of a Bulk Metallic

Glass", J.J. Lewandowski, Engineering Foundation Conference on Bulk Metallic Glasses, Singapore, September 27, 2000.

\*\* "Fracture and Fatigue of Refractory Metals and Intermetallic Composites", J.J. Lewandowski, AFOSR Program Review, St. Louis, MO, October 12, 2000.

"Forgeability Studies on Aluminum Composite Materials", N. Prabhu and J.J. Lewandowski, MPIF International Meeting, Troy, MI, November 3, 2000.

\*\*\*"Layered/Laminated Materials for Structural Applications", J.J. Lewandowski, ALCOA Technical Center, Pittsburgh, PA, November 17, 2000.

## **2001**

\*\*\*"Fracture and Fatigue of Refractory Metal Intermetallic Composites", J.J. Lewandowski, GE-CRD, Schenectady, NY, January 12, 2001.

\*\*\*"Damage Tolerant Refractory Metal Intermetallic Composites", J.J. Lewandowski, WPAFB, Dayton, OH, February 6, 2001.

"Effect of Superimposed Pressure on Fracture of Automotive Alloys", J.L. Gimple, D.S. Wilkinson, J.D. Embury, and J.J. Lewandowski, TMS Annual Meeting, New Orleans, LA, February 12, 2001.

"Effects of Superimposed Pressure on Flow and Fracture of Al-Be Composites", J. Larose and J.J. Lewandowski, TMS Annual Meeting, New Orleans, LA, February 15, 2001.

"Fracture and Fatigue of Al-Be Composites", J. Larose and J.J. Lewandowski, TMS Annual Meeting, New Orleans, LA, February 15, 2001.

\*\*\*"Pressure and Stress State Effects on Flow and Fracture of Inorganic Materials", J.J. Lewandowski, International Conference on the Fundamentals of Fracture 6 – ICFF-6, Cirencester, UK, March 29, 2001.

\*\*\*"Pressure and Stress State Effects on Flow and Fracture of Inorganic Materials", J.J. Lewandowski, Dept. Chemical and Materials Engineering, Arizona State University, Tempe, AZ, April 6, 2001.

\*\*\*"Fracture and Fatigue Behavior of Be-Al Alloys", J.J. Lewandowski, ONR Review Meeting, Woods Hole, MA, June 14, 2001.

\*\*\*"Pressure Effects on Flow and Fracture of Inorganic Materials", J.J. Lewandowski, Dept. of Engineering Science and Mechanics, Pennsylvania State University, State College, PA, June 18, 2001.

\*\*\*"Fracture and Fatigue of Bulk Metallic Glass", J.J. Lewandowski, OAI Lecture Series, Ohio Aerospace Institute, Cleveland, OH, June 29, 2001.

\*\*\*"Fracture of Al MMC's", J.J. Lewandowski, US National Computational Mechanics Symposium, Detroit, MI, August 3, 2001.

"Flow and Fracture of Automotive Aluminum Alloys", J.L. Gimple, D.S. Wilkinson, J.D.

Embury, and J.J. Lewandowski, Canadian Institute of Metallurgists, Toronto, Canada, August 28, 2001.

\*\*\*"Forgability Determination Study on Aluminum Composites", J.J. Lewandowski, N.S. Prabhu, and E.J. Hilinski, Fall TMS Meeting, Indianapolis, IN, November 7, 2001.

"Fracture and Fatigue of Be-Al Composite Materials", J. Larose and J.J. Lewandowski, Fall TMS Meeting, Indianapolis, IN, November 8, 2001.

\*\*\*"Processing and Properties of Amorphous Aluminum Alloys", J.J. Lewandowski, Ames Laboratory, Ames, IA, November 15, 2001.

\*\*\*"Fracture and Fatigue of Toughened Composites", J.J. Lewandowski, J. Larose, and S. Solv'yev, ICF-10, Honolulu, HI, December 4, 2001.

\*\*\*"Processing of Bulk Metallic Glass", J.J. Lewandowski, WPAFB Workshop on Amorphous Metals, Dayton, OH, December 11, 2001.

## **2002**

\*\*\*"Effects of Multiaxial Stresses on Flow and Fracture of Bulk Metallic Glass", J.J. Lewandowski, DARPA/California Institute of Technology Workshop on Structural Amorphous Metals, Pasadena, CA, January 10, 2002.

\*\*\*"Fracture Surface Characterization and Characteristics", J.J. Lewandowski, Brush-Wellman Company, Cleveland, OH, January 31, 2002.

"Effects of Stress State on Shear Banding", J.J. Lewandowski and P. Lowhaphandu, TMS Annual Meeting, Seattle, WA, February 19, 2002.

"Fracture and Fatigue of Be-Al Composite Materials", J. Larose and J.J. Lewandowski, TMS Annual Meeting, Seattle, WA, February 20, 2002.

"Fracture and Fatigue of Bulk Metallic Glass Composite Materials", J.J. Lewandowski, S. Solv'yev, and P. Lowhaphandu, TMS Annual Meeting, Seattle, WA, February 21, 2002.

"Structure-Property Relationships in Amorphous Materials", P. Wesseling and J.J. Lewandowski, Dept. Materials Sci. and Eng., Delft University of Technology, Rotterdam, Delft, March 12, 2002.

\*\*\*"Stress State and Temperature Effects on Flow/Fracture of Amorphous Metals – Relevance to Deformation Processing", J.J. Lewandowski, Engineering Foundation Conference on Bulk Metallic Glasses II, Keelung, Taiwan, March 25, 2002.

"Effects of Annealing and Annealing with Pressure on Structural Evolution and Mechanical Properties of Al<sub>87</sub>Ni<sub>7</sub>Gd<sub>6</sub> Metallic Glass", B.C. Ko, P. Wesseling, L.O. Vatamanu, and J.J. Lewandowski, Engineering Foundation Conference on Bulk Metallic Glasses II, Keelung, Taiwan, March 26, 2002.

\*\*\*"Flow and Fracture of Bulk Metallic Glasses", J.J. Lewandowski, National Taiwan University – Dept. Materials Science and Engineering, Taipei, Taiwan, March 28, 2002.

- “Fracture and Fatigue of Nb, Nb Alloys, and Nb Silicide Composites”, J.J. Lewandowski, D. Padhi, and S. Solv'yev, ISSI-III, Jackson, WY, April 30, 2002.
- \*\*”Processing and Property Studies on Bulk Metallic Glasses”, J.J. Lewandowski, Stanford University - Dept. Materials Science and Engineering, Palo Alto, CA, May 17, 2002.
- \*\*”Pressure Effects on Structure Evolution in Metallic Glasses”, J.J. Lewandowski, DARPA SAM Meeting, San Francisco, CA, June 20, 2002.
- \*\*”Processing Effects on Structure Evolution and Properties in Aluminum Based Metallic Glasses”, J.J. Lewandowski, Boeing Phantom Works, Saint Louis, MO, July 17, 2002.
- \*\*”Pressure/Stress State Effects on Flow and Fracture of Inorganic Materials and Composites”, J.J. Lewandowski, Georgia Institute of Technology - Dept. Materials Science and Engineering, Atlanta, GA, August 1, 2002.
- \*\*”Strategies for Sustained Growth and Excellence in Materials Science and Engineering”, J.J. Lewandowski, Georgia Institute of Technology - Dept. Materials Science and Engineering, Atlanta, GA, August 1, 2002.
- \*\*”Pressure/Stress State Effects on Flow and Fracture of Inorganic Materials and Composites”, J.J. Lewandowski, University of Cambridge - Dept. Materials Science and Metallurgy, Cambridge, UK, August 20, 2002.
- “Sustained Load Cracking of Al Alloys”, S.L. Johnson, J.J. Lewandowski, and N.J.H. Holroyd, ASM/TMS Fall Meeting, Columbus, OH, October 7, 2002.
- “Effects of Changes in Layer Thickness on Fatigue Crack Propagation of Laminated Metal Composites”, H. Hassan, M. Abd Latif, and J.J. Lewandowski, ASM/TMS Fall Meeting, Columbus, OH, October 8, 2002.
- “Effects of Changes in Load Ratio on Fatigue Crack Growth in a Fully Pearlitic Eutectoid Steel”, A. El Shabasy and J.J. Lewandowski, ASM/TMS Fall Meeting, Columbus, OH, October 8, 2002.
- “Effects of Annealing on Structure and Mechanical Properties of Al<sub>87</sub>Ni<sub>7</sub>Gd<sub>6</sub> Metallic Glass”, P. Wesseling, B.C. Ko, L.O. Vatamanu, J. Caris, and J.J. Lewandowski, ASM/TMS Fall Meeting, Columbus, OH, October 8, 2002.
- “Formability Studies on Cu-Based Composites”, A. Awadallah, G.M. Michal, D. Ellis, and J.J. Lewandowski, ASM/TMS Fall Meeting, Columbus, OH, October 8, 2002.
- “Fracture Toughness of Amorphous Metals and Composites”, J.J. Lewandowski, A.K. Thurston, and P. Lowhaphandu, MRS Symposium Supercooled Liquids, Glass Transition, Bulk Metallic Glasses, Boston, MA, December 4, 2002.
- “Effects of Annealing and Annealing with Pressure on Devitrification of Al<sub>87</sub>Ni<sub>7</sub>Gd<sub>7</sub>”, P. Wesseling, P. Lowhaphandu, and J.J. Lewandowski, MRS Symposium on Supercooled Liquids, Glass Transition, and Bulk Metallic Glasses, Boston, MA, December 5, 2002.
- “Hardness Indentation Studies on Metallic Glasses”, P. Wesseling, P. Lowhaphandu, and J.J. Lewandowski, MRS Meeting, Boston, MA, December 2, 2002.

"Effects of Superimposed Pressure on Flow and Fracture of Two Bulk Amorphous Metals", P. Wesseling, P. Lowhaphandu, and J.J. Lewandowski, MRS Meeting, Boston, MA, December 2, 2002.

### **2003**

\*\*"Fracture and Fatigue of Bulk Glasses", J.J. Lewandowski, California Institute of Technology, Pasadena, CA, January 9, 2003.

\*\*"Deformation Behavior of Amorphous Metals", J.J. Lewandowski, WPAFB, Dayton, OH, February 3, 2003.

\*\*"Toughness of Metallic Glass and Bulk Metallic Glass", J.J. Lewandowski and P. Lowhaphandu, TMS Spring Meeting, San Diego, CA, March 4, 2003.

\*\*"Pressure Effects on Flow, Fracture, and Processing of NiAl", J.J. Lewandowski, R.W. Margevcicius, and J.D. Rigney, TMS Spring Meeting, San Diego, CA, March 4, 2003.

"Effects of Changes in Test Temperature and Notch Radius on Fracture Toughness of Fully Pearlitic Eutectoid Steel", A.B. El-Shabasy and J.J. Lewandowski, TMS Spring Meeting, San Diego, CA, March 5, 2003.

"Effects of Mixed Mode Loading on Fracture Toughness of Fully Pearlitic Eutectoid Steel at Low Temperature", A.B. El-Shabasy and J.J. Lewandowski, TMS Spring Meeting, San Diego, CA, March 5, 2003.

"Effects of Changes in Test Temperature on Fatigue Crack Propagation in Laminated Metal Composites", H.A. Hassan, J.J. Lewandowski, and M.H. Abdlatif, TMS Spring Meeting, San Diego, CA, March 5, 2003.

"Fracture and Fatigue of Amorphous Metals and Composites", J.J. Lewandowski, Liquidmetal, Lake Forest, CA, March 6, 2003.

\*\* "Deformation and Fracture Studies on Amorphous Metals", J.J. Lewandowski, Cal Tech DARPA Review Meeting, Washington, DC, March 30, 2003.

"Formability of a High Performance Copper Alloy: GRCop-84", A. Awadallah, G.M. Michal, D.L. Ellis, and J.J. Lewandowski, CWRU SHOWCASE, Cleveland, OH, April 4, 2003.

"Test Temperature Effects on Fatigue in Laminated Metal Composites", H.A. Hassan, J.J. Lewandowski, and M.H. Abdl-Latif, CWRU SHOWCASE, Cleveland, OH, April 4, 2003.

"Effects of Mixed Mode Loading on Fracture Toughness of Fully Pearlitic Eutectoid Steel at Low Temperature", A.B. El-Shabasy and J.J. Lewandowski, CWRU Research SHOWCASE, Cleveland, OH, April 4, 2003.

\*\*Effects of Interfaces on Systems Containing Amorphous Metals", J.J. Lewandowski, ONR Steels Review, St. Michael, MD, April 11, 2003.

\*\*'Amorphous Metals-Properties and Performance", J.J. Lewandowski, Lawrence Livermore Nat'l Lab, Livermore, CA, April 30, 2003.

- \*\*"Deformation and Fracture of Amorphous Metals" J.J. Lewandowski, Lawrence Livermore Nat'l Lab Staff Seminar, Livermore, CA, April 30, 2003.
- \*\*"Deformation and Fracture of Amorphous Metals" J.J. Lewandowski, SRI International, Menlo Park, CA, May 1, 2003.
- \*\*"Deformation and Fracture of Foams", J.J. Lewandowski, ONR Review, Woods Hole, MA, May 29, 2003.
- \*\*"Studies on Metallic Glasses", J.J. Lewandowski, DARPA Review, Arlington, VA, July 7, 2003.
- \*\*"Fracture and Fatigue of Amorphous Aluminum Alloys", J.J. Lewandowski, Questek, Chicago, IL, July 15, 2003.
- \*\*"Deformation and Fracture Studies on Amorphous Metals", J.J. Lewandowski, Exxon-Mobil Company, Annandale, NJ, July 22, 2003.
- "Blast Resistant Materials and Structures Testing", J.J. Lewandowski and V. Prakash, Airlie, VA, September 3, 2003.
- \*\*"Fracture and Fatigue of Be-Al Alloys", J.J. Lewandowski, Brush-Wellman, Cleveland, OH, September 5, 2003.
- \*\*"Deformation and Fracture of BMG and BMG Composites", P. Wesseling and J.J. Lewandowski, BMG III, Beijing, China, October 14, 2003.
- \*\*"Deformation and Fracture of High Toughness BMG and BMG Composites", J.J. Lewandowski, Composites at Lake Louise, Lake Louise, Canada, October 22, 2003.
- "Effects of Annealing on Structure and Properties of Amorphous Aluminum", P. Wesseling and J.J. Lewandowski, Composites at Lake Louise, Lake Louise, Canada, October 23, 2003.
- "Fracture Studies on BMG and BMG Composites", A.K. Thurston and J.J. Lewandowski, Composites at Lake Louise, Lake Louise, Canada, October 23, 2003.
- \*\*"Fracture and Fatigue of Nb Alloys and Silicide Composites", J.J. Lewandowski, Rolls Royce R&D Laboratory, Derby, UK, October 29, 2003.
- \*\*"Flow, Fracture, and Fatigue of Bulk Metallic Glass and Composites", J.J. Lewandowski, Gordon Seminar Series, University of Cambridge, UK, October 31, 2003.
- \*\*"Effects of Changes in Notch Radius and Mixed Mode Loading on Toughness of Fully Pearlitic Eutectoid Steel", A.B. El-Shabasy and J.J. Lewandowski, TMS Fall Meeting, Chicago, IL, November 10, 2003.
- \*\*"Cleavage Fracture of Pearlitic Microstructures Containing 7 to 15 Volume Percent Cementite", G.M. Michal, T.D. Nixon, and J.J. Lewandowski, TMS Fall Meeting, Chicago, IL, November 10, 2003.

\*\*\*"Effects of Load-Ratio and Test Temperature on Fatigue Crack Growth Behavior of Fully Pearlitic Euctectoid Steel", A.B. El-Shabasy and J.J. Lewandowski, TMS Fall Meeting, Chicago, IL, November 10, 2003.

\*\*\*"Effects of Changes in Test Temperature on Fatigue Crack Propagation of Laminated Metal Composites (LMCs)", H.A. Hassan , J.J. Lewandowski, and M.H. Abd El-Latif, TMS Fall Meeting, Chicago, IL, November 10, 2003.

"Fracture of Bulk Metallic Glass Composites", A.K. Thurston and J.J. Lewandowski, TMS Fall Meeting, Chicago, IL, November 10, 2003.

"Formability of a Dispersion Strengthened Cu-Cr-Nb Alloy", A. Awadallah, G.M. Michal, D.L. Ellis, and J.J. Lewandowski, TMS Fall Meeting, Chicago, IL, November 12, 2003.

"Fracture and Fatigue of Bulk Metallic Glass", J.J. Lewandowski, Engineering Department, University of Cambridge, UK, November 25, 2003.

\*\*\*"Fracture and Fatigue of Nb Alloys and Composites", J.J. Lewandowski, International Conference on Nb Alloys for High Temperature Applications", Araxa, Brazil, December 2, 2003.

\*\*\*"Effects of Changes in Stress State on Damage Evolution in Structural Materials", J.J. Lewandowski, Dept. Materials Science, Louvain La Nueve, Belgium, December 12, 2003.

## **2004**

\*\*\*"Deformation and Fracture Issues in Bulk Metallic Glasses", J.J. Lewandowski, INPG, Grenoble, France, January 6, 2004.

\*\*\*"Deformation and Fracture Issues in Bulk Metallic Glasses", J.J. Lewandowski, INSA, Lyon, France, January 7, 2004.

"Effects of Mixed Mode Loading on Fracture of Bulk Metallic Glasses", A.K. Thurston and J.J. Lewandowski, TMS Annual Meeting, Charlotte, NC, March 17, 2004.

"Fatigue of Laminated Metal Composites", H.A. Hassan, P. Wesseling, and J.J. Lewandowski, TMS Annual Meeting, Charlotte, NC, March 17, 2004.

"Novel Deformation Processing of Amorphous Metals", P. Wesseling and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 2, 2004.

\*\*\*"Bulk Metallic Glasses - Materials of the Future?", J.J. Lewandowski, Postprandial Talk, Churchill College, University of Cambridge, UK, April 23, 2004.

\*\*\*"Interface Effects on Fracture of Metallic Glass Coatings", J.J. Lewandowski, DARPA/DOE Workshop on Yucca Mountain Storage Issues, Arlington, VA, April 26, 2004.

\*\*\*"Effects of Interfaces on Energy Absorption in Bulk Metallic Glasses and Composites", J.J. Lewandowski, Navy Steels Meeting, Annapolis, MD, May 20, 2004.

\*\*\*"Effects of Changes in Loading Rate on Aluminum Alloys", J.J. Lewandowski, ONR Program

Review, Woods Hole, MA, June 4, 2004.

\*\*"Experiments and Modeling of Pb-Induced Sustained Load Cracking in Aluminum Alloys", J.J. Lewandowski, P.M. Singh, and N.J.H. Holroyd, NUMIFORM, Columbus, OH, June 16, 2004.

"Opporunities in Bulk Metallic Glasses and Composites", J.J. Lewandowski, Qinetiq Visit to University of Cambridge, Cambridge, UK, July 15, 2004.

\*\*"Deformation and Fracture of Bulk Metallic Glasses", J.J. Lewandowski, T. Jacobs, and A.L. Greer, European Physical Society Meeting, Prague, Czech Republic, July 19, 2004.

\*\*"Effects of Microstructure and Loading Rate on Aluminum Alloys Used in Blast Resistant Structures", J.J. Lewandowski, X. Tang, A. Nouri, and V. Prakash,, Workshop on Blast Resistant Materials and Structures, Airlie, VA, September 1, 2004.

\*\*"Flow, Fracture, and Biocompatibliity of Bulk Metallic Glasses", J.J. Lewandowski, Dept. Materials Science and Engineering, CWRU, Cleveland, OH, September 21, 2004.

"Mechanical Behavior of BMG/BCC Metal Composites", P. Wesseling, A.K. Thurston, P. Lowhaphandu, and J.J. Lewandowski, TMS Fall Meeting, New Orleans, LA, September 28, 2004.

\*\*"Fracture and Fatigue of Nb Alloys and Composites", J.J. Lewandowski, NASA Glenn Research Center, Cleveland, OH, October 5, 2004.

## **2005**

\*\*"Fracture and Fatigue of Devitrified Amorphous Aluminum Alloys", J.J. Lewandowski, Univ. of Missouri-Rolla, Rolla, MO, January 10, 2005.

"Experimental Observations of Shear Banding in Bulk Metallic Glass", J.J. Lewandowski, N.A. Stelmashenko, and A.L. Greer, TMS Annual Meeting, San Francisco, CA, February 15, 2005.

"Ductile vs Brittle Behavior of Metallic Glasses", J.J. Lewandowski, W.H. Wang, and A.L. Greer, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

"Effects of Changes in Notch Radius on Deformation and Fracture of a Bulk Metallic Glass", T. Jacobs, J.J. Lewandowski, A.L. Greer, and S. Tin, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

"Effects of Changes in Specimen Geometry and Loading Rate on a Bulk Metallic Glass", G. Sunny, A.S. Nouri, J.J. Lewandowski, and V. Prakash, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

"Effects of Superimposed Pressure on Flow and Fracture of BMG's and Devitrified Amorphous Aluminum Alloys", P. Wesseling, L.O. Vatamanu, and J.J. Lewandowski, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

"High Temperature Hardness Indentation Studies on Metallic Glasses", P. Wesseling and J.J. Lewandowski, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

"Effects of Changes in Microstructure and Strain Rate on Flow of 6061 Aluminum", A.S. Nouri,

X. Tang, J.J. Lewandowski, and V. Prakash, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

"Novel Deformation Processing of Amorphous Metal MEMS and Larger Structures", P. Wesseiling, A.S. Nouri, and J.J. Lewandowski, TMS Annual Meeting, San Francisco, CA, February 16, 2005.

\*\*"Flow and Fracture Studies on Metallic Glasses", J.J. Lewandowski, ONR Naval Steels and Welding Meeting, Warrenton, VA, March 31, 2005.

"High Strength Copper-Nickel-Tin Alloy for Electrical Applications", J. Caris, J.J. Stephens, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2005.

"Effects of Superimposed Pressure and Elevated Temperature on Flow and Fracture of a Zr-based bulk metallic glass and Nano-structured Al alloy", L.O. Vatamanu and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2005.

"Dynamic Behavior of Zr based Bulk Metallic Glass with Applications to Blast Resistant Structures", G. Sunny, V. Prakash, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2005.

"Dynamic Deformation of Advanced Aluminum Alloys with Applications to Ultra-light Weight Blast Resistant Naval Structures", X. Tang, V. Prakash, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2005.

"Effects of (Micro)structural Changes on Mechanical Properties of Open-Cell Nickel Foams", K. Lee and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2005.

\*\*"Flow and Fracture Studies on BMG's and Composites", J.J. Lewandowski, BMG IV, Gatlinburg, TN, May 4, 2005.

\*\*"Effects of Changes in Loading Rate and Test Temperature on Aluminum Alloys and Aluminum Truss Structures", J.J. Lewandowski, ONR Program Review, Woods Hole, MA, June 2, 2005.

"Mechanical Testing Facilities at CWRU", J.J. Lewandowski, Visit of DELPHI to CWRU, Cleveland, OH, June 23, 2005.

\*\*"Fracture and Fatigue of Aerospace Materials", J.J. Lewandowski, Timken VAATE Kickoff Meeting, WPAFB, OH, June 29, 2005.

\*\*"Brittleness or Plasticity of Metallic Glasses", A.L. Greer and J.J. Lewandowski, ISMANAM, Paris, France, July 5, 2005.

"Fatigue of Wires", J.J. Lewandowski, DELPHI visit to CWRU, Cleveland, OH, August 25, 2005.

\*\*"Effects of Changes in Loading Rate, Test Temperature, and Heat Treatment on Aluminum Alloys and Aluminum Truss Structures", J.J. Lewandowski, ONR Meeting on Materials and Structures for Advanced Ship Protection, Warrenton, VA, August 30, 2005.

"Fracture of Brittle Metallic Glasses: Brittleness or Plasticity", X.K. Xi, D.Q. Zhao, M.X. Pan,

- W.H. Wang, Y. Wu, and J.J. Lewandowski, EUROMAT 2005, Prague, Czech Republic, September 5, 2005.
- “High Strength Cu-Ni-Sn Alloy for Electrical Connector Applications”, J.B. Caris, J.J. Stephens, and J.J. Lewandowski, MS&T, Pittsburgh, PA, September 26, 2005.
- “Mechanical Behavior of Cu-Based Bulk Metallic Glasses”, J.J. Lewandowski, A. Awadallah, P. Wesseling, W.H. Wang, and Y. Liu, MS&T, Pittsburgh, PA, September 27, 2005.
- “Fracture of Bulk Metallic Glass-W Composites”, A. Vormelker, M. Shazly, L. Kecskes, and J.J. Lewandowski, MS&T, Pittsburgh, PA, September 28, 2005.
- “Dynamic Deformation Behavior of Aluminum Alloys and Aluminum Alloy Truss Structures”, X. Tang, M. Shazly, V. Prakash, A. Nouri, and J.J. Lewandowski, MS&T, Pittsburgh, PA, September 28, 2005.
- “Effects of Changes in Specimen Geometry and Loading Rate on a Bulk Metallic Glass”, G. Sunny, J.J. Lewandowski, and V. Prakash, MS&T, Pittsburgh, PA, September 28, 2005.
- “Microstructure Effects on Fracture and Fatigue of Advanced Nb-Si Alloys”, M. Shazly, Y. Liu, and J.J. Lewandowski, MS&T, Pittsburgh, PA, September 28, 2005.
- \*\*“Flow and Fracture Studies on Bulk Metallic Glasses”, J.J. Lewandowski, International Workshop on Flow and Fracture of Advanced Glasses, State College, PA, October 5, 2005.
- \*\*“Materials for National Security”, J.J. Lewandowski, 125<sup>th</sup> Anniversary of CASE, Case Western Reserve University, Cleveland, OH, October 15, 2005.
- \*\*“High Toughness Amorphous Metals and Composites”, J.J. Lewandowski, Composites at Lake Louise, Lake Louise, Canada, October 30, 2005.
- \*\*“High-Performance Corrosion-Resistant Materials for Naval Warfare & Safe Storage of Spent Nuclear Fuel – Mechanical Behavior of Amorphous Metal Systems”, J.J. Lewandowski, Nuclear Waste Technical Review Board (NWTRB), Arlington, VA, November 16, 2005.
- \*\*“Effects of Heat Treatment and Loading Rate on Materials for National Security”, J.J. Lewandowski, ONR, Arlington, VA, November 29, 2005.
- \*\*“Flow and Fracture Studies on Amorphous Metals and Composites”, J.J. Lewandowski, MRS Meeting, Boston, MA, December 1, 2005.
- \*\*“High-Performance Corrosion-Resistant Materials for Naval Warfare & Safe Storage of Spent Nuclear Fuel – Mechanical Behavior of Amorphous Metals”, J.J. Lewandowski, Office of Civilian and Radioactive Waste Management (OCRWM), Las Vegas, NV, December 6, 2005.
- \*\*“Fracture and Fatigue Studies on Nb and Nb Alloys”, J.J. Lewandowski, GE-Global, Schenectady, NY, December 19, 2005.

## 2006

- \*\*"Flow, Fracture, and Fatigue of Metallic Glasses and Composites", J.J. Lewandowski, Kennametal Research Center, Latrobe, PA, January 6, 2006.
  
- \*\*"Mechanical Behavior of Amorphous Metal Systems", J.J. Lewandowski, DOE/DARPA HPCRM Meeting, Key West, FLA, January 18, 2006.
  
- \*\*"Fracture and Fatigue Behavior of Materials for Bearing Applications", J.J. Lewandowski, TIMKEN R&D, Canton, OH, February 8, 2006.
  
- \*\*"Fracture and Fatigue Behavior of Metal Matrix Composites", J.J. Lewandowski, TIMKEN R&D, Canton, OH, February 8, 2006.
  
- \*\*"Flow and Fracture Studies on Bulk Metallic Glasses and Composites", J.J. Lewandowski, ASM Canton-Massillon Chapter, Canton, OH, February 8, 2006.
  
- "Effects of Changes in Test Temperature and Loading Rate on the Fracture Toughness of Bulk Metallic Glass-W Composites", A. Vormelker, M. Shazly, L. Kecskes, and J.J. Lewandowski, 2006 Int'l Conference on W, Refractory and Hardmetals VI, Orlando, FLA, February 8, 2006.
  
- \*\*"Flow and Fracture Studies on Bulk Metallic Glasses and Composites", J.J. Lewandowski, University of Illinois at Urbana-Champaign, Dept. Materials Science and Engineering, Urbana-Champaign, ILL, February 20, 2006.
  
- \*\*"Mechanical Behavior of Amorphous Metal Systems", J.J. Lewandowski, Caterpillar Tractor, Peoria, ILL, February 21, 2006.
  
- \*\*"Flow and Fracture Studies on Bulk Metallic Glasses and Composites", J.J. Lewandowski, TMS Annual Meeting, San Antonio, TX, March 13, 2006.
  
- "Scaling Laws in Fracture of Metallic Glasses", X.K. Xi, D.Q. Zhao, M.X. Pan, Y. Wu, and J.J. Lewandowski, APS Meeting, Baltimore, MD, March 15, 2006.
  
- "High Strength Cu-Ni-Sn Alloy for Electrical Applications", J. Caris, J.J. Stephens, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.
  
- "Effects of Changes in Test Temperature and Pressure on Bulk Metallic Glasses (BMGs)", L.O. Vatamanu, A. Vormelker, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.
  
- "Intrinsic and Extrinsic Toughening of Bulk Metallic Glasses", A. Shamimi Nouri, M. Shazly, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.
  
- "Effects of Changes in Test Temperature and Pressure on Bulk Metallic Glasses (BMGs)", L.O. Vatamanu, A. Vormelker, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.
  
- "High Strain-Rate Compression of As-Cast and Annealed Bulk Metallic Glass", G. Sunny, V. Prakash, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.
  
- "Dynamic Deformation Behavior of Al Alloys and Al Alloy Truss Structures", X. Tang, V.

Prakash, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.

"Damage Assessment of the Effect of Hydrostatic Pressure on Equine Bone", K. Lee, J.J. Lewandowski, C.M. Rinnac, C. Hernandez, and L.O. Vatamanu, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.

"Mechanical Behavior/Performance of Implantable Silver-Cored Conducting Cables", J.J. Lewandowski, H.M. Ha, Y. Liu, J.H. Payer, M. Shazly, and C.J. Tuma, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.

"Temperature Sensitive Nano-Scale Coatings with High Spatial and Temporal Resolution", J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 6, 2006.

\*\*"Flow and Fracture Studies on Bulk Metallic Glasses", J.J. Lewandowski, Engineering Foundation Conference on Mechanics and Properties of Noncrystalline Materials, I: Amorphous Metals, Beijing, China, April 25, 2006.

\*\*"Flow, Fracture, and Fatigue Studies on Composites and Bulk Metallic Glasses", J.J. Lewandowski, 2006 ASM-TMS Spring Symposium – Hudson-Mohawk Chapter, GE Global Research, Niskayuna, NY, May 23, 2006.

\*\*"Flow and Fracture Studies on Bulk Metallic Glasses", J.J. Lewandowski, ONR Steels Meeting, Arlington, VA, May 25, 2006.

"Dynamic Tensile Deformation of Aluminum Alloy 6061-T6 and 6061-OA", X. Tang, V. Prakash, and J.J. Lewandowski, Soc. Exp. Mechanics, St. Louis, MO, June 5, 2006.

"Dynamic Compression of Amorphous and Annealed Bulk Metallic Glass", G. Sunny, J.J. Lewandowski, and V. Prakash, Soc. Exp. Mechanics, St. Louis, MO, June 5, 2006.

"Fracture and Fatigue of Candidate Bearing Materials", J.J. Lewandowski, Air Propulsion Directorate – Wright Patterson Air Force Base, Dayton, OH, September 14, 2006.

\*\*"Flow and Fracture Studies on Bulk Metallic Glasses", J.J. Lewandowski, Chemical Engineering Seminar Series, Case Western Reserve University, Cleveland, OH, September 28, 2006.

\*\*"Mechanical Behavior of Implantable Electrodes", J.J. Lewandowski, Cleveland MetroHealth Center Hospital, Cleveland, OH, October 11, 2006.

"High Strength Cu-Ni-Sn Alloy for Electrical Connector Applications", J.B. Caris, J.J. Lewandowski, and J.J. Stephens, MS&T '06, Cincinnati, OH, October 16, 2006.

"Dynamic Compression Behavior of 6061 Aluminum Alloy Truss Structures", X. Tang, V. Prakash, and J.J. Lewandowski, MS&T '06, Cincinnati, OH, October 17, 2006.

"Dynamic Tensile Deformation of Aluminum Alloys AA-6061 and AA-5083", X. Tang, V. Prakash, and J.J. Lewandowski, MS&T '06, Cincinnati, OH, October 17, 2006.

"Effects of Test Temperature on Flow of Metallic Glasses", A.S. Nouri, Y. Liu, P. Wesseling, and J.J. Lewandowski, MS&T '06, Cincinnati, OH, October 17, 2006.

“Experiments on High Strain-Rate Compression of a Bulk Metallic Glass”, G. Sunny, J.J. Lewandowski, and V. Prakash, MS&T '06, Cincinnati, OH, October 18, 2006.

“Temperature and Loading Rate Effects on Mechanical Behavior of Bulk Metallic Glasses and Composites”, A.H. Vormelker, M. Shazly, L. Vatamanu, J.J. Lewandowski, and L. Kecskes, MS&T '06, Cincinnati, OH, October 18, 2006.

## **2007**

\*\*“Mechanical Behavior of Advanced Bearing Materials”, J.J. Lewandowski and D. Herman, Timken-VAATE meeting, Timken R&D, Canton, OH, January 18, 2007.

\*\*“Department of Materials Science and Engineering Overview”, J.J. Lewandowski, OAI-CWRU Site Visit, CWRU, Cleveland, OH, February 2, 2007.

\*\*“Flow and Fracture Studies on Bulk Metallic Glasses”, J.J. Lewandowski, TMS Annual Meeting, Orlando, FL, February 26, 2007.

“Experiments on High Strain-Rate Compression of Bulk Metallic Glass”, G. Sunny, V. Prakash, and J.J. Lewandowski, TMS Annual Meeting, Orlando, FL, February 26, 2007.

“High Strain-Rate Compression of As-Cast and Annealed Bulk Metallic Glass”, G. Sunny, J.J. Lewandowski, and V. Prakash, TMS Annual Meeting, Orlando, FL, February 26, 2007.

“Spall Strength of a Zr-Based Bulk Metallic Glass”, F. Yuan, J.J. Lewandowski, and V. Prakash, TMS Annual Meeting, Orlando, FL, February 27, 2007.

“Mechanical Properties and Structure of Cu-15Ni-8Sn after Thermal Excursions”, J.B. Caris, J.J. Lewandowski, and J. Stephens, TMS Annual Meeting, Orlando, FL, February 28, 2007.

“Structure of Shock Waves and Hugoniot Elastic Limit of a Zr-Based Bulk Metallic Glass”, F. Yuan, V. Prakash, and J.J. Lewandowski, TMS Annual Meeting, Orlando, FL, March 1, 2007.

\*\*“Bulk Metallic Glasses: Materials of the Future?”, J.J. Lewandowski, UMS Meeting, CWRU, Cleveland, OH, March 29, 2007.

\*\*“Graduate Materials Research in Support of National Priorities”, J.J. Lewandowski, Symposium Day 2007, Michigan State University, East Lansing, MI, April 9, 2007.

“Spall Strength and Hugoniot Elastic Limit of a Zr-based Bulk Metallic Glass”, F. Yuan, J.J. Lewandowski, and V. Prakash, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“Heat Treatment Effects on Structure Evolution and Mechanical Properties of Cu-15Ni-8Sn”, J.B. Caris, J.J. Stephens, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“Deformation and Fracture Experiments on Advanced Aerospace Materials”, D. Herman and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“Thermal Exposure Effects on Mechanical Behavior of Fe-, Zr-, and Al-based Metallic Glass”, C.K. Huang, A.S. Nouri, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland,

OH, April 12, 2007.

“Ductile vs Brittle Behavior of Metallic Glasses”, A.S. Nouri, W.H. Wang, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“Center for Mechanical Characterization of Materials”, J.J. Lewandowski and C.J. Tuma, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“Mechanical Behavior of Implantable Silver-cored Composite Cables”, R. Varadarajan, L.O. Vatamanu, B. Smith, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“High Strain-Rate Compression of Zr- and Fe-based Bulk Metallic Glasses”, G. Sunny, J.J. Lewandowski, and V. Prakash, Research SHOWCASE, CWRU, Cleveland, OH, April 12, 2007.

“Bulk Metallic Glasses: Materials of the Future?”, A.S. Nouri and J.J. Lewandowski, SCSAM Dedication, CWRU, Cleveland, OH, April 16, 2007.

\*\*“Hydrostatic Extrusion: Effects of Changes in Stress State on Flow, Fracture, and Deformation Processing of Materials”, J.J. Lewandowski, ASM Education Seminar, OAI, Cleveland, OH, May 9, 2007.

\*\*“Effects of Changes in Loading Rate, Stress State, and Test Temperature on Flow, Fracture, and Fatigue of Amorphous Aluminum Alloys”, J.J. Lewandowski, Pratt & Whitney SAM II Kickoff Meeting, San Antonio, TX, May 17, 2007.

\*\*“Flow and Fracture of Bulk Metallic Glasses”, J.J. Lewandowski, 1<sup>st</sup> US/Poland Technical Exchange, Polish Academy of Sciences/Warsaw University of Technology, Warsaw, Poland, May 24, 2007.

\*\*“Loading Rate and Heat Treatment Effects on Flow and Fracture of Aluminum Alloys/Structures for Naval Applications”, J.J. Lewandowski, ONR Review – Colorado School of Mines, Golden, CO, May 30, 2007.

“Microdamage Assessment in Equine Bone Resulting from High Hydrostatic Pressure and/or Irradiation”, K. Lee, K.E. Warden, O.L. Vatamanu, C.J. Hernandez, C.M. Rimnac, and J.J. Lewandowski, 2007 Society for Experimental Mechanics (SEM) Annual Conference, Springfield, MASS, June 4, 2007.

\*\*“Flow and Fracture Studies on Bulk Metallic Glasses”, J.J. Lewandowski, ONR Steels Review, Alexandria, VA, June 14, 2007.

\*\*“High Strain-Rate Compression of a Zr-based Bulk Metallic Glass”, G. Sunny, V. Prakash, and J.J. Lewandowski, Polytecnico di Turino, Turin, Italy, September 5, 2007.

“High Strain-Rate Compression of Zirconium- and Iron-Based Bulk Metallic Glasses”, G. Sunny, V. Prakash, and J.J. Lewandowski, Euromat 2007 - European conference and Exhibition on Advanced Materials and Processes], Nuremberg, Germany, September 11, 2007.

“Experiments on High Strain-Rate Compression of a Zr-based Bulk Metallic Glass”, G. Sunny, V. Prakash, and J.J. Lewandowski, Materials Science and Technology 2007 Conference,

Detroit, MI, September 17, 2007.

“Dynamic Response of a Zr-based Bulk Metallic Glass under Combined Pressure-shear Loading”, F. Yuan, V. Prakash, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 17, 2007.

“Thermal Exposure Effects on Mechanical Behavior of Iron-based Metallic Glass”, A. Shamimi Nouri and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 17, 2007.

“Quasi-Static and Dynamic Compression of Fe-based Bulk Metallic Glass”, G. Sunny, A. Shamimi Nouri, V. Prakash, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 17, 2007.

“Effects of Composition Changes on Mechanical Properties of Iron Based Metallic Glass Ribbons”, A. El-Shabasy, H.A. Hassan, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 17, 2007.

“Effects of Thermal Exposure on Fatigue Crack Propagation of Laminated Metal Composites (LMCs)”, H.A. Hassan, A. El-Shabasy, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 17, 2007.

“Heat Treatment Effects on Structure Evolution and Mechanical Properties of Cu-15Ni-8Sn”, J. Caris, D. Li, J.J. Stephens, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 17, 2007.

\*\*“Intrinsic and Extrinsic Approaches to Plasticity/Toughness of Bulk Metallic Glasses”, J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 18, 2007.

\*\*“Novel Flow Behavior of Bulk Metallic Glasses”, J.J. Lewandowski, Solidica, Ann Arbor, MI, September 18, 2007.

“Strength and Structural Evolution of Cu-15Ni-8Sn with Heat Treatment”, J.B. Caris, J. Stephens, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 20, 2007.

“Fracture and Fatigue Behavior of Multi-strand Implantable Electrodes”, R. Varadarajan, L.O. Vatamanu, B. Smith, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 20, 2007.

“A Microstructure Investigation Along the Path of Fatigue Crack Growth in a Nb-10 at% Si Alloy”, Y. Liu, M. Shazly, and J.J. Lewandowski, Materials Science and Technology 2007 Conference, Detroit, MI, September 20, 2007.

\*\*“Techniques for Assessing Effects of Changes in Test Temperature and Strain Rate on Flow Stress and Friction Coefficient Relevant to Friction Stir Welding Conditions”, J.J. Lewandowski, ONR Friction Stir and Technology Meeting, Midway, UT, October 17, 2007.

\*\*“Unique Flow and Fracture Behavior of Bulk Metallic Glasses/Composites”, J.J. Lewandowski, Composites at Lake Louise, Lake Louise, Canada, October 29, 2007.

\*\*\*"Ultrasonic Bonding of Metallic Glass", J.J. Lewandowski, DARPA-SAIC, Arlington, VA, November 29, 2007.

\*\*\*"Flow and Fracture Studies on Metallic Glasses", J.J. Lewandowski, MRS Symposium on Bulk Metallic Glasses, Boston, MA, November 30, 2007.

## **2008**

\*\*\*"Flow and Fracture Studies on Bulk Metallic Glasses", J.J. Lewandowski, BP Visit to Dept. Matls Sci. and Eng., Case Western Reserve University, Cleveland, OH, February 1, 2008.

\*\*\*"Flow and Fracture Studies on Bulk Metallic Glasses and Composites", J.J. Lewandowski, Dept. Matls Sci. and Engineering, The Ohio State University, Columbus, OH, February 8, 2008.

\*\*\*"Interface Effects on Fracture and Fatigue of Laminated Aluminum Composites", J.J. Lewandowski, TMS Annual Meeting, New Orleans, LA, March 10, 2008.

\*\*\*"Dynamic and Shock Response of a Zr-based Bulk Metallic Glass", G. Sunny, F. Yuan, V. Prakash, and J.J. Lewandowski, Army Research Laboratory, Aberdeen, MD, March 13, 2008.

\*\*\*"Flow and Fracture Studies on Bulk Metallic Glasses and Composites", J.J. Lewandowski, Dept. Matls Sci. and Engineering, Georgia Institute of Technology, Atlanta, GA, April 8, 2008.

"Effect of Sensitization on the Microstructure and the Mechanical Properties of 5XXX Aluminum Alloys", D. Li, H. Hassan, A. El-Shabasy, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Effects of Superimposed Pressure on Flow of Metallic Glass", A. Shamimi Nouri, J. Caris, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Center for Mechanical Characterization of Materials", J.J. Lewandowski and C.J. Tuma, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Fatigue and Toughness of Nb-Si Alloys", D.M. Herman and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Mechanical Characterization of Implantable Composite Leadwires to be used in Next Generation Neuroprostheses Systems", R. Varadarajan, B. Smith, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Effects of Temperature and Loading Rate on Mechanical Behavior of Calcium-based Bulk Metallic Glass", J. Caris and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Dynamic Compression Behavior of Zirconium- and Iron-based Bulk Metallic Glasses", G. Sunny, V. Prakash, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

"Effects of Load Ratio, R, and Temperature on High Cycle Fatigue Behavior of Nanostructured  $Al_{89}Gd_7Ni_3Fe_1$  Composite" A.D. El-Shabasy, H.A. Hassan, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

“Effects of Changes in Test Temperature and Notch Radius on Fracture and Fatigue Crack Growth of Nano-Composite Aluminum Alloys”, H.A. Hassan, A.B. El-Shabasy, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

“Shock Response of a Zr-based Bulk Metallic Glass”, F. Yuan, V. Prakash, and J.J. Lewandowski, Research SHOWCASE, CWRU, Cleveland, OH, April 17-18, 2008.

\*\*\* Fracture Studies on UT Bonded Mg-based Glasses”, J.J. Lewandowski, DARPA-Boeing Review, DARPA, Arlington, VA, April 18, 2008.

\*\*\* Flow and Fracture Behavior of Metallic Glasses and Composites”, J.J. Lewandowski, Naval Research Laboratory, Washington, DC, May 1, 2008.

“Fracture and Fatigue Crack Growth of Nano-Composite Aluminum Alloys”, H.A. Hassan, A.B. El-Shabasy, and J.J. Lewandowski, 2008 International Conference on Tungsten, Refractory & Hardmetals VII, Washington, D.C., June 9, 2008.

“High Cycle Fatigue Behavior of a Nano-structured Composite Produced via Extrusion of Amorphous  $Al_{89}Gd_7Ni_3Fe$  Alloy Powders”, A.B. El-Shabasy, H.A. Hassan, and J.J. Lewandowski, 2008 International Conference on Tungsten, Refractory & Hardmetals VII, Washington, D.C., June 9, 2008.

“Effects of Changes in Test Temperature on Fracture Toughness of Bulk Metallic Glass/W Composites”, A. Vormelker, H.A. Hassan, L. Kecskes, and J.J. Lewandowski, 2008 International Conference on Tungsten, Refractory & Hardmetals VII, Washington, D.C., June 12, 2008.

\*\*\* Dynamic and Shock Response of a Zr-based Bulk Metallic Glass”, G. Sunny, F. Yuan, V. Prakash, and J.J. Lewandowski, Los Alamos National Laboratory, Los Alamos, NM, June 13, 2008.

\*\*\* Effects of Heat Treatment on Structure Evolution and Mechanical Behavior of Cu-15Ni-8Sn”, J. Caris and J.J. Lewandowski, Los Alamos National Laboratory, Los Alamos, NM, June 13, 2008.

\*\*\*Flow and Fracture Studies on Fe-based BMGs”, J.J. Lewandowski, ONR Steels Review, Arlington, VA, July 15, 2008.

\*\*\*Evolving Protocol for Qualification Testing of Implantable Cables”, J.J. Lewandowski, J.H. Payer, R. Varadarajan, and H. Ha, ASM Conference on Materials and Processes for Medical Devices: Opportunities for Next Generation Implants, Cleveland, OH, August 7, 2008.

\*\*\*Evolving Protocol for Qualification Testing of Implantable Cables”, J.J. Lewandowski, J.H. Payer, R. Varadarajan, and H. Ha, Cleveland FES Meeting, Cleveland, OH, August 20, 2008.

“Effects of Notch Radius, Test Temperature and Mixed Mode Loading on the Toughness of a Nano-Structured Al Composite”, H.A. Hassan, A.B. El-Shabasy, and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 5, 2008.

“Fracture and Fatigue of  $Fe_{78}Si_9B_{13}$  Metallic Glass Ribbons”, A.B. El-Shabasy and J.J.

Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 5, 2008.

“Fatigue and Toughness of Nb-Si Alloys”, D.M. Herman and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 5, 2008.

“Effects Fatigue Behavior, Strength, and Structure Evolution of Cu-15Ni-8Sn”, J. Caris, R. Varadarajan, J.J. Stephens, and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 6, 2008.

“Effects of Superimposed Pressure on Flow of Metallic Glass”, J. Caris and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 7, 2008.

“Effects of Test Temperature and Composition on Mechanical Properties of Al-Based Amorphous Alloys”, C.K. Huang and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 7, 2008.

“Experiments on High Strain-Rate Loading of a Zirconium-based Bulk Metallic Glasses”, G. Sunny, V. Prakash, and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 7, 2008.

“Effects of Thermal Exposure and Test Temperature on Structure Evolution and Viscosity of an Iron-based Metallic Glass”, A. Shamimi Nouri and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 7, 2008.

“Effects of Changes in Viscosity on Flow Characteristics”, L. Deibler and J.J. Lewandowski, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 7, 2008.

\*\*\*“Fracture and Fatigue of Implantable Cables”, J.J. Lewandowski, R. Varadarajan, and B. Smith, Materials Science and Technology 2008 Conference, Pittsburgh, PA, October 8, 2008.

\*\*\*“Effects of Changes in Test Temperature and Strain Rate on Flow Stress and Friction Coefficient Relevant to Friction Stir Welding Conditions”, J.J. Lewandowski, ONR Friction Stir Science and Technology Review Meeting, Hedgesville, WV, October 22, 2008.

\*\*\*“Fracture and Fatigue of Niobium Silicide Alloys”, J.J. Lewandowski, MRS Fall Meeting, Boston, MA, December 3, 2008.

## **2009**

\*\*\*“Flow and Fracture Behavior of Metallic Glasses”, J.J. Lewandowski, School of Materials – Arizona State University, Tempe, AZ, January 16, 2009.

\*\*\*“Fracture and Fatigue of Advanced Nb-Si Alloys”, J.J. Lewandowski, TMS Annual Meeting, San Francisco, CA, February 17, 2009.

\*\*\*“Intrinsic and Extrinsic Factors Affecting the Plasticity/Toughness of Bulk Metallic Glasses”, J.J. Lewandowski, TMS Annual Meeting, San Francisco, CA, February 18, 2009.

## **JOHN J. LEWANDOWSKI-FUNDED PROPOSALS**

### **1986**

1. ALCOA Research Fellowship, ALCOA, \$30K, 1/87-, PI
2. CWRU Research Initiation Grant, CWRU, \$5K, 9/86-, PI
3. Fracture of Interfaces, DARPA-ONR, \$4.3M / 3yrs, 9/86-, Co-PI

### **1987**

1. Micromechanisms of Fracture in Composites, AIME, \$20K, 8/87-8/88, PI
2. Pressure Effects on Fracture, RIG-OBR and CWRU, \$1K, 12/87-11/88, PI
3. Pb Embrittlement in Al-Mg-Si Alloys, ALCAN In'tl Fellowship, \$32K + \$15K, 1/87, PI
4. Fracture of Particle Hardened Materials, ALCOA, \$40K, 3/87-2/89, PI
5. NASA Space Center, NASA, \$3M / 3yrs, 9/87-, Co-PI
6. Aluminide Composites, GE, \$58.5K, 9/87-, Co-PI

### **1988**

1. Aluminide Fracture, GE, \$49.5K, 5/88-5/89, Co-PI
2. Fracture of Nb-Si Composites, Universal Technical Corporation, \$24K, 2/88-7/88, PI
3. Al Based Composites, DURAL, \$230K, 9/88-9/90, PI

### **1989**

1. Toughness of Composites, ARO, \$261K, 3/89-2/92, PI
2. Ductile Phase Toughening of Silicides, AFOSR, \$497K, 9/89-9/92, PI
3. NSF Presidential Young Investigator Award, NSF, \$500K, 7/89-6/94, PI
4. IGR Powerpack, Edison, \$125K, 8/89-8/90, Co-PI
5. NiAl Fracture, NASA, \$100K, 1/89-1/90, Co-PI

### **1990**

1. High Pressure Equipment and Match, DARPA and CWRU, \$500K, 2/90-, PI
2. Fracture of NiAl, NASA, \$100K, 1/90-1/94, PI

### **1991**

1. High Pressure/ High Temp Studies, ONR, \$379K, 1/91-12/93, PI
2. NASA-Center For Space Studies, NASA, \$665K, Continuing, Co-PI
3. Multizone Furnace, NASA, \$40K, 9/91-, PI
4. MTS Fellowship, MTS, \$28K, Continuing, PI

### **1992**

1. Multizone Furnace, NASA, \$5K, 7/92-6/93, PI
2. NASA-CCDS, NASA, \$246K, 10/92-10/93, PI
3. MTS Fellowship, MTS, \$28K, 6/92-6/93, PI
4. NSF-REU, NSF, \$19.5K, 8/91-7/94, PI
5. ALCOA Laminates, ALCOA, \$50K, Continuing, PI
6. Mg-MMC, AMT, \$40K, 6/92-9/92, PI

## **1993**

1. NSF-Image Analysis, NSF, \$217K, 7/93-6/96, Co-PI
2. NASA-Orthorhombic Composites, NASA, \$40K, 3/93-2/94, PI
3. Silicide Laminates, AFOSR, \$505K, 5/93-4/96, PI

## **1994**

1. NASA-Orthorhombic Composites, NASA, \$40K, 3/94-2/95, Co-PI
2. NASA-NiAl, NASA, \$200K, Continuing, Co-PI
3. ALCOA Laminates, ALCOA, \$50K, Continuing, PI

## **1995**

1. Toughened DRA, OAI, \$30K, 1/95-12/95, PI
2. NSF Instrumentation, NSF, \$1.1M, 5/95-6/96, Co-PI
3. NSF GOALI, NSF, \$42K, 8/95-7/96, PI
4. NASA-Orthorhombic Composites, NASA, \$40K, 2/95-1/96, Co-PI

## **1996**

1. Fatigue of Toughened Materials, AFOSR, \$540K, 7/96-6/99, PI
2. Fracture of Bulk Metallic Glasses-AASERT, AFOSR, \$150K, 7/96-6/99, PI
3. Support of MRS Symposium, AFOSR/ONR, \$7.5K, 1/96-12/96, PI

## **1997**

1. Stress State Effects on Composites, ONR, \$240K, 10/97-9/00, PI

## **1998** (None)

## **1999**

1. Fracture of Bulk Metallic Glass, NASA, \$41K, 3/99-10/99, Co-PI
2. Architecture Effects on Ti Composites, NASA, 14K, 3/99-10/99, Co-PI
3. MTS Fellowship, \$56K, 1/99-12/00, PI
4. Fracture of Bulk Metallic Glass, Howmet, \$15K, 2/99-1/00, PI
5. Fracture of Squeeze Cast Al, Luxfer, \$20K, 6/99-5/00, PI
6. Fracture of Advanced Refractory Intermetallics, GE, \$80K, 1/99-12/01, PI
7. DBTT Steels, ERDA, \$28K, 11/99-10/00, PI

## **2000**

1. NSF Instrumentation-Camera, NSF, \$290K, 7/00-6/01, Co-PI
2. OBR Matching Funds, OBR, \$145K, 7/00-6/01, Co-PI
3. Fracture Refractory MMCs, AFOSR, \$88K, 10/99-9/00, PI
4. Toughened Metallic Glass, Reference Metals, \$35K, 7/00-6/02, PI
5. Gordon Conference, DARPA, \$20K, 5/00-9/00, PI
6. Gordon Conference, AFOSR, \$5K, 5/00-9/00, PI
7. Gordon Conference, ONR, \$2K, 5/00-9/00, PI
8. Gordon Conference, DOE/BES, \$10K, 5/00-9/00, PI

9. Gordon Conference, NSF-DMR, \$5.4K, 5/00-9/00, PI
10. Gordon Conference, NSF-DMII, \$5.4K, 5/00-9/00, PI
11. Gordon Conference, NASA Glenn, \$1.1K, 5/00- 9/00, PI
12. Gordon Conference, CTC, Inc., \$10K, 5/00- 9/00, PI
13. Gordon Conference, GRC, \$20K, 5/00- 9/00, PI
14. Gordon Conference, GE-CRD, \$2.5K, 5/00- 9/00, PI
15. Gordon Conference, FORD, \$500, 5/00- 9/00, PI
16. Gordon Conference, GE-AE, \$500, 5/00- 9/00, PI
17. Gordon Conference, LANL, \$7K, 5/00- 9/00, Co-PI
18. Gordon Conference, MTS, \$1K, 5/00- 9/00, PI
19. Gordon Conference, CSE/CWRU, \$500, 5/00- 9/00, PI
20. Gordon Conference, CMCL, \$500, 5/00- 9/00, PI

## **2001**

1. Tough Metallic Glass, DARPA/CalTech, \$351K, 5/01-4/04, PI
2. Al Metallic Glass-Pressure Effects, DARPA/Boeing, \$507K, 9/01-8/04, PI
3. Al Metallic Glass-Processing, DARPA/Boeing, \$75K, 9/01-8/04, PI
4. Toughness of Steels-DBTT, ERDA, \$67K, 1/01-12/01, PI
5. Fatigue of Cu-Be, Brush Wellman, \$8K, 5/01-6/01, PI
6. Fracture of Refractory Silicide, Reference Metal, \$30K, 8/01-7/02, PI
7. Pressure Effects IN-718, NASA Glenn, \$14K, 1/01-12/01, PI
8. Toughness of Steels-DBTT, ERDA, \$67K, 1/01-12/01, PI
9. Toughness of Steels-DBTT, ERDA, \$10K, 1/01-12/01, PI
10. Fatigue of Cu-Be, Brush Wellman, \$6K, 5/01-6/01, PI

## **2002**

1. Deformation Processing Met Glass, ARO, \$185K, 9/02-5/03, PI
2. Channel Exchange-Egypt, Egypt Embassy, \$18K, 6/01-7/02, PI
3. MTS Fellowship, MTS, \$14K, 6/01-12/02, PI
4. Leonard Case Chair, CWRU, \$5K, 7/00-7/05, PI

## **2003**

1. Blast-Resistant Materials, ONR, \$300K, 1/03-12/05, PI
2. Interface Effects on Energy Absorb, ONR, \$800K, 1/03-12/06, PI
3. Fracture Refractory Metals, Reference Metal, \$35K, 8/03-7/04, PI
4. MTS Fellowship, MTS Corp, \$14K, 6/01-12/03, PI
5. Fracture High T Composites, GE-CRD, \$10K, 8/02-7/03, PI
6. Leonard Case Chair, CWRU, \$5K, 7/00-7/05, PI

## **2004**

1. Fracture of BMG/W Composites, ARO, \$60K, 9/03-5/05, PI

## **2005**

1. Fracture of BMG/W Composite, ARO, \$60K, 9/03-5/05, PI
2. Fracture High T Composite, GE-CRD, \$9.5K, 1/05-11/05, PI
3. Hot Deformation Studies, TIMKEN, \$1.6K, 11/04-4/05, PI

4. Leonard Case Chair, CWRU, \$5K, 7/00-7/05, PI
5. Stress States of Coating, LLNL, \$7.5K, 8/04-9/06, PI
6. High Performance Coatings, DOE, \$157.5K, 3/05-5/06, PI
7. Fatigue of Biomedical Wires, NIH/FES, \$66.9K, 9/02-9/06, PI
8. NPSC Fellowship, NPSC, \$23K, 7/04-6/06, PI
9. Low Mass Aerospace Bearings, TIMKEN/AF, \$110K, 7/05-7/08, PI

## **2006**

1. High Performance Corrosion Resistant Coatings, DOE, \$357K/yr, 8/04-10/07, PI
2. Damage Tolerant Fe-Based BMG, UVa/DARPA/ONR, \$130K, 9/06-8/08, PI
3. Fatigue of Implantable Electrodes, NIH/FES, \$400K (\$200K/year), 9/04-8/07, PI
4. Fracture/Fatigue Devitrified Amorphous Al Alloys, DARPA/P&W, \$413K, 9/06-8/08, PI
5. HCF and Impact of Al Alloys, P&W, \$135K, 10/06-9/07, PI
6. Fatigue and Impact-MMCs, DWA, \$61K, 12/05-, PI
7. Fracture Refractory Alloys, GE Global, \$35K, Ongoing, PI
8. NPSC Fellowship, NPSC, \$23K/year, 7/04-7/07, PI
9. Processing/Properties Synthetic Bone, CWRU-PRL, \$80K, 6/06-5/08, Co-PI

## **2007**

1. Damage Tolerant Fe-Based BMG, UVa/DARPA/ONR, \$150K, 9/06-8/08, PI
2. Fatigue of Implantable Electrodes, NIH/FES, \$400K (\$200K/year), 9/04-8/07, PI
3. Fracture/Fatigue Devitrified Amorphous Al Alloys, DARPA/P&W, \$413K, 9/06-8/08, PI
4. Fracture Refractory Alloys, GE Global, \$35K, Ongoing, PI
5. NPSC Fellowship, NPSC, \$23K/year, 7/04-7/07, PI
6. Blast Resistance of 5XXX Al Alloys, ONR, \$360K, 3/07-2/10, PI
7. FSW Studies on HSLA-65, ONR, \$370K, 3/07-2/10, PI
8. US-Egypt International Grant, NSF, \$60K, PI
9. Design of Ca-based BMGs, DARPA, \$150K, PI
10. Layered Mg-Metallic Glasses, Boeing, \$150K, PI

## **2008**

1. Fatigue of Implantable Electrodes, NIH/FES, \$600K (\$200K/year), 9/04-8/08, PI
2. Blast Resistance of 5XXX Al Alloys, ONR, \$360K, 3/07-2/10, PI
3. FSW Studies on HSLA-65, ONR, \$370K, 3/07-2/10, PI
4. US-Egypt International Grant, NSF, \$60K, 9/04-6/09, PI
5. Design of Ca-based BMGs, DARPA, \$150K, 9/04-6/09, PI
6. Layered Mg-Metallic Glasses, Boeing, \$150K, 9/04-3/10, PI

## **2009**

1. Fatigue of Implantable Electrodes, NIH/FES, \$800K (\$200K/year), 9/04-8/09, PI
2. Blast Resistance of 5XXX Al Alloys, ONR, \$360K, 3/07-2/10, PI
3. FSW Studies on HSLA-65, ONR, \$370K, 3/07-2/10, PI
4. US-Egypt International Grant, NSF, \$60K, 9/04-6/09, PI
5. Design of Ca-based BMGs, DARPA, \$150K, 9/04-6/09, PI
6. Layered Mg-Metallic Glasses, Boeing, \$150K, 9/04-3/10, PI
7. High Tg Bulk Metallic Glasses, AFOSR, \$150K, 4/09-10/09, PI

**TOTAL FUNDED PROPOSALS (through 2009): Approximately \$23,065,000.00**

### **JOHN J. LEWANDOWSKI – GOVERNMENT FUNDING SOURCES**

AFOSR, ARO, DARPA, DOE, DOE/BES, ERDA, LANL, LLNL, NASA HQ, NASA GLENN, NIH, NSF-DMR, NSF-DMII, NSF-REU, NSF-IMI, ONR

### **JOHN J. LEWANDOWSKI – FOUNDATION FUNDING SOURCES**

ALCOA, AIME, OAI, Gordon Research Conferences, NPSC, Ohio Board Regents

### **JOHN J. LEWANDOWSKI - INDUSTRY FUNDING SOURCES**

ALCOA, AMT, ALCAN, Boeing, Brush Wellman, CTC, DURALCAN, DWA Composites, Ford, General Electric, Howmet, IGR, Luxfer, MTS, Pratt & Whitney, Reference Metals, Timken, Universal Technology, UES

**TOTAL FUNDED PROPOSALS (1986-2009): Approximately \$23,065,000.00**

### **JOHN J. LEWANDOWSKI – CENTER FOR MECHANICAL CHARACTERIZATION**

Established 1987 – Houses equipment valued in excess of \$3M.

Employs One Full Time Staff Member.

Internal and External Users may access facility at Federally Audited Rates.

**Annual Budget Exceeds \$100K/yr.**

**Have Generated/Expended \$2.3M from 1987-2009.**

### **JOHN J. LEWANDOWSKI – ADVISEES, POST-DOCTORAL, VISITING SCHOLARS**

#### **MS Students (58):**

H. Kanai (1987), Kanai Steel, Japan  
M. Doty (1988), Latrobe Steel, Latrobe, PA  
T. Spear (1989), Lincoln Electric, Cleveland, OH  
D. Henderson (1989),  
J. D. Rigney (1990), GE Aviation, Evendale, OH  
D. Miller (1991), Midland Steel, Cleveland, OH  
S. Maloy (1991), Los Alamos National Lab, Los Alamos, NM  
M. Assel (1991), NASA Glenn Research Center, Cleveland, OH  
J. Wolfe (1991), TIMKEN, Canton, OH  
J. Frank (1992),  
L. Ellis (1992),  
F. Ritzert (1992), NASA Glenn Research Center, Cleveland, OH  
T. Osman (1993), TMS, Warrendale, PA  
A.L. Grow (1994), TIMKEN, Canton, OH  
J. Walkup (1994), Proctor & Gamble, Cincinnati, OH  
Y. Esmaelipour (1995),  
A. Vaidya (1995), Mahindra & Mahindra Ltd., Mumbai, India  
P. Lowhaphandu (1995), Thainox Steel, Bangkok, Thailand  
J. Short (1995), GE Global, Schenectady, OH  
A. Samant (1996), Praxair, Danbury, CT

C. Robinson (1996), NASA Glenn Research Center, Cleveland, OH  
L. Ludrosky (1998), Motorola, Phoenix, AZ  
J. McCrindle (1998),  
W. Zinsser (1998), Robert Bosch LLC, Farmington Hills, MI  
P. Dickerson (1999), Los Alamos National Lab, Los Alamos, NM  
J. Oviedo (1999),  
G. Ramachandran (1999), Lockheed Martin Space Systems, San Jose, CA  
K. Subramanian (2000), Savannah River National Lab, Aiken, SC  
J. Carrigan (2000), LUXFER USA, Riverside, CA  
N. Prabhu (2001), Cessna Aircraft, Wichita, KS  
D. Padhi (2001), Applied Materials, Santa Clara, CA  
N. Atwood (2001),  
J. Larose (2001), Pratt & Whitney, Montreal, Canada  
S. Johnson (2002), LUXFER USA, Riverside, CA  
F. Jokhio (2003), CWRU MBA Program, Cleveland, OH  
P. Wesseling (2003), McWilliams Forge, Rockaway, NJ  
J. Caris (2003), CWRU, Cleveland, OH  
D. Hotter (2003),  
K. Mayer (2004), ALCOA, Cleveland, OH  
A. Awadallah (2004), Ft. Lauderdale, FLA  
A. Thurston (2004), Wyman-Gordon, Boston, MA  
T. Jacobs (2004), Meso Scale Diagnostics, LLC, Gaithersburg, MD  
D. Bush (2005), ALCOA, Cleveland, OH  
S. Solv'yev (2006), Pratt & Whitney, East Hartford, CT  
K. Lee (2006), Peace Corps, Nigeria  
A. Vormelker (2006), MMC, Euclid, OH  
X. Tang (2006), Univ. Illinois, Urbana, ILL  
G. Sunny (2007), CWRU, Cleveland, OH  
P. Dahlstrom (2007), Foseco, Solon, OH  
J. McNatt (2008), NASA Glenn Research Center, Cleveland, OH  
D. Herman (2009), Technion, Haifa, Israel  
L. Diebler (2009), CWRU, Cleveland, OH  
R. Barrie (in progress), NASA Glenn Research Center, Cleveland, OH  
T. Biles (in progress), ALCOA, Cleveland, OH  
S. Schriener (in progress), Mittal Steel, Cleveland, OH  
B. Benini (in progress), CWRU, Cleveland, OH  
J. Brosi (in progress), CWRU, Cleveland, OH  
S. Dike (in progress), CWRU, Cleveland, OH.

**Ph.D. Students (22):**

Y.S. Kim (1989), KAIST, Korea  
D.S. Liu (1990), Chung-Chen University, Taiwan  
C. Liu (1992), Thermo-disc, Mansfield, OH  
R.W. Margevicius (1992), Los Alamos National Lab, Los Alamos, NM  
G.A. Rozak (1993), HC Starck/Bayer, Cleveland, OH  
J. Kajuch (1993), Liquidmetal, Lake Forest, CA  
J.D. Rigney (1993), GE Aviation, Evendale, OH  
S.A. Maloy (1993), Los Alamos National Lab. Los Alamos, NM  
T.M. Osman (1995), TMS, Warrendale, PA  
E. Hilinski (1996), US Steel R&D, Monroeville, PA  
L. Ellis (1998),

C. Bowman (1999), NASA Glenn Research Center, Cleveland, OH  
P. Lowhaphandu (1999), Thainox Steel, Bangkok, Thailand  
H. Hassan (2003), Ain Shams University, Cairo, Egypt  
J. Caris (2007), CWRU, Cleveland, OH  
F. Yuan (2007), CWRU, Cleveland, OH  
A.S. Nouri (2009), CWRU, Cleveland, OH  
G. Sunny (in progress), CWRU, Cleveland, OH  
K. Subramanian (in progress), Savannah River National Lab, Aiken, SC  
P. Wesseling (in progress), McWilliams Forge/PCC, Rockaway, NJ  
C. Huang (in progress), CWRU, Cleveland, OH  
L. Diebler (in progress), CWRU, Cleveland, OH

### **Postdoctoral Scholars (19):**

P. Khadkikar (1988-89), Thermo-disc, Mansfield, OH  
M. Manoharan (1988-90), GE Global, Schenectady, NY  
A. Kharchenko (1990),  
A. Ahmetsoğlu (1989-90),  
P.M. Singh (1990-93), Georgia Institute of Technology, Atlanta, GA  
J. Zhang (1991-92), TRW, Los Angeles, CA  
S. Patankar (1991-93), University of Idaho, Moscow, ID  
C. Liu (1992-93), Thermo-disc, Mansfield, OH  
R.W. Margevicius (1992-93), Los Alamos National Lab, Los Alamos, NM  
D. Schwam (1992-93), CWRU, Cleveland, OH  
J.D. Rigney (1993, 1996), GE Aviation, Evendale, OH  
S. Wen (1998), Chinese Academy Sciences, Beijing, China  
P. Lowhaphandu (2000), Thainox Steel, Bangkok, Thailand  
B.C. Ko (2001-03), Korea  
L.O. Vatamanu (2001-07), Powdermet, Cleveland, OH  
Y. Liu (2005-06), Wayne State University, Detroit, MI  
M. Shazly (2005-06), Cairo University, Cairo, Egypt  
D. Li (2005-present), CWRU, Cleveland, OH  
R. Varadarajan (2006-present), CWRU, Cleveland, OH  
J.B. Caris (2007-present), CWRU, Cleveland, OH  
F. Yuan (2007-present), CWRU, Cleveland, OH  
X.J. Gu (2008-present), CWRU, Cleveland, OH

### **Visiting Scholars (11):**

Y. Wang (1992-93),  
C. Zhu (1992-93),  
D.S. Liu (1996-97), Chung-Chen University, Taiwan  
Z. Liu (1996-97),  
A. El-Shabasy (2001-03), Ain Shams University, Cairo, Egypt  
S. Zhang (2002),  
H. Hassan (2006), Ain Shams University, Cairo, Egypt  
A. El-Shabasy (2006), Ain Shams University, Cairo, Egypt  
H. Hassan (2007-08), Ain Shams University, Cairo, Egypt  
A. El-Shabasy (2007-08), Ain Shams University, Cairo, Egypt  
C. Chung (2007), National Sun yat-sen University, Kaohsiung, Taiwan

**Staff (3):**

C. Tuma (1987-present), CWRU, Cleveland, OH

S. Solv'yev (1998), Pratt & Whitney, East Hartford, CT

A. Awadallah (2004-06). Ft. Lauderdale, FLA