

DAVID L. MCDOWELL

Regents' Professor and Carter N. Paden, Jr. Distinguished Chair in Metals Processing
The George W. Woodruff School of Mechanical Engineering
Joint Appointment, School of Materials Science and Engineering
Georgia Institute of Technology

I. EARNED DEGREES

Ph.D.	May 1983	University of Illinois (UIUC)	Mechanical Engineering
M.S.	Jan. 1981	University of Illinois (UIUC)	Mechanical Engineering
B.S.	May 1979	University of Nebraska	Mechanical Engineering

II. EMPLOYMENT

Georgia Institute of Technology:

Executive Director, Institute for Materials	2012-present
Carter N. Paden, Jr. Distinguished Chair in Metals Processing	Sept. 1998-present
Regents' Professor	1996-present
Professor, Mechanical Engng.	1992-1996
Chair, Institute Materials Council	1994-2012
Director, Mechanical Properties Research Laboratory	1992-2012
Associate Professor, Mechanical Engng.	1987-1992
Associate Director, Mechanical Properties Research Laboratory	1983-1992
Assistant Professor, Mechanical Engng.	1983-1987

CURRENT FIELDS OF INTEREST

- Finite strain inelasticity and defect field mechanics
- Generalized continuum theory for gradient plasticity and more general classes of evolving microstructure
- Microstructure-sensitive computational approaches to variability in fatigue of advanced alloy systems
- Constitutive equations, hierarchical simulation and design of energetic metal powder systems and ultra high performance concrete under shock loading
- Atomistic simulations of dislocation nucleation and mediation at grain boundaries, including near equilibrium and non-equilibrium structures

- Scaling laws and avalanche behavior of competing deformation modes for nanocrystalline materials; grain size distribution effects on yield and inelastic flow
- Multiscale computational coarse graining/homogenization methods ranging from molecular dynamics to higher length and time scale continuum theory transitions
- Principles and approaches for systems-based computational materials design

III. TEACHING

Courses Taught:

Mechanics of Materials (ME 3201)
 Statics (COE 2001)
 Statistics and Numerical Methods in MSE (MSE 3025)
 Principles of Continuum Mechanics (ME 6201)
 Mathematical, Statistical, and Computational Techniques in Materials Science (MSE 6795)
 Fatigue of Materials and Structures (ME 7774)
 Advanced Constitutive Relations for Solids (ME 7203)
 Mechanics and Applications of Nanostructured Materials and Devices (ME 7205)

Teaching Awards

1. SAE Ralph R. Teetor Award, 1986.
2. ASEE Dow Outstanding Young Faculty Award, 1990
3. Jack M. Zeigler Outstanding Educator Award, GWW School of Mechanical Engineering, 2004.

More than 80 graduate students advised or co-advised, and more than 20 post docs and visiting scholars hosted.

IV. SCHOLARLY ACCOMPLISHMENTS

A. Published Books and Parts of Books

1. Fracture Mechanics: Twenty-Second Symposium (Volume I), ASTM STP 1131, Philadelphia, PA, Eds. H.A. Ernst, A. Saxena and D.L. McDowell, 1992.
2. Advances in Multiaxial Fatigue, ASTM STP 1191, Philadelphia, PA, Eds. D.L. McDowell and J.R., Ellis, 1993.
3. Applications of Continuum Damage Mechanics to Fatigue and Fracture, ASTM STP 1315, Philadelphia, PA, Ed. D.L. McDowell, 1997.
4. Mixed Mode Crack Behavior, ASTM STP 1359, Philadelphia, PA, Eds. D.L. McDowell and K.J. Miller, 2000.
5. Fox, M.F., Colatrella, C., McDowell, D.L., and Realff, M.L., "Equity in Tenure and Promotion: An Integrated Institutional Approach." in Transforming Science and Engineering: Advancing Academic Women, Eds. Abigail Stewart, Janet

- Malley, and Danielle Lavaque-Manty, University of Michigan Press, October 2007.
6. Tschopp, M.A., Spearot, D.E., and McDowell, D.L., "Influence of Grain Boundary Structure on Dislocation Nucleation in FCC Metals," Dislocations in Solids, A Tribute to F.R.N. Nabarro, Ed. J.P. Hirth, Elsevier Publ., Vol. 14, 2008, pp. 43-139.
 7. McDowell, D.L., "Microstructure-Sensitive Modeling and Simulation of Fatigue," *ASM Handbook on Fundamentals of Modeling for Metals Processing*, Handbook Vol. 22A, ASM International, 2009, ISBN 13:978-1-61503-001-0.
 8. McDowell, D.L. and Backman, D., "Simulation-Assisted Design and Accelerated Insertion of Materials," Ch. 19 in *Computational Methods for Microstructure-Property Relationships*, Eds. S. Ghosh and D. Dimiduk, Springer, 2010, ISBN 978-1-4419-0642-7.
 9. Zimmerman, J.A., Jones, R.E., Templeton, J.A., McDowell, D.L., Mayeur, J.R., Tucker, G.J., Bammann, D.J., and Gao, H., "Development of Advanced Continuum Models that Incorporate Nanomechanical Deformation into Engineering Analysis, Sandia Report SAND2008-6066, September 2008 (244 pages).
 10. McDowell, D.L., Panchal, J.H., Choi, H.-J., Seepersad, C.C., Allen, J.K. and Mistree, F., Integrated Design of Multiscale, Multifunctional Materials and Products, 1st Edition, Oxford: Butterworth-Heinemann, 2010 (392 pages), ISBN: 978-1-85617-662-0.
 11. McDowell, D.L., "Critical Path Issues in ICME," Models, Databases, and Simulation Tools Needed for the Realization of Integrated Computational Materials Engineering, Proc. Symposium held at Materials Science and Technology 2010, Oct. 18-20, Houston, Tx, S.M. Arnold and T.T. Wong, eds., ASM International, 2011, pp. 31-37.

B. Refereed Publications

Journal Publications

1. McDowell, D. L., D. F. Socie, and H. S. Lamba, "Multiaxial Nonproportional Cyclic Deformation," *Low-Cycle Fatigue and Life Prediction*, ASTM STP 770, C. Amzallag, B. N. Leis, and P. Rabbe, Eds., American Society for Testing and Materials, 1982, pp. 500-518.
2. McDowell, D. L. and Socie, D. F., "Transient and Stable Deformation Behavior Under Cyclic Nonproportional Loading," *ASTM STP 853*, 1985, pp. 64-87.
3. Hayhurst, D. R., Leckie, F. A., and McDowell, D. L., "Damage Growth Under Nonproportional Loading," *ASTM STP 853*, 1985, pp. 688-699.
4. Fash, J. W., Socie, D. F., and McDowell, D. L., "Fatigue Life Estimates for a Simple Notched Component Under Biaxial Loading," *ASTM STP 853*, 1985, pp. 497-513.

5. McDowell, D. L., "A Two Surface Model for Transient Nonproportional Cyclic Plasticity: Part I - Development of Appropriate Equations," ASME Journal of Applied Mechanics, Vol. 52, June 1985, pp. 298-302.
6. McDowell, D. L., "A Two Surface Model for Transient Nonproportional Cyclic Plasticity: Part II - Comparison of Theory with Experiments," ASME Journal of Applied Mechanics, Vol. 52, June 1985, pp. 303-308.
7. McDowell, D. L., "An Experimental Study of the Structure of Constitutive Equations for Nonproportional Cyclic Plasticity," ASME Journal of Engineering Materials and Technology, Vol. 107, Oct. 1985, pp. 307-315.
8. Sotolongo, W., and McDowell, D.L., "An Evaluation of Several Constitutive Model Structures for Transient Nonproportional Cyclic Plasticity," ASME Journal of Pressure Vessel Technology, Vol. 108, Aug. 1986, pp. 273-279.
9. Sotolongo, W., and McDowell, D.L., "On the Numerical Integration of Elasto-Plastic Constitutive Model Structures for Nonproportional Cyclic Loading," Computers and Structures, Vol. 24, No. 4, 1986, pp. 595-606.
10. McDowell, D.L., "An Evaluation of Recent Developments in Hardening and Flow Rules for Rate-Independent, Nonproportional Cyclic Plasticity," ASME Journal of Applied Mechanics, Vol. 54, No. 2, 1987, pp. 323-334.
11. McDowell, D.L., "A Simple, Experimentally Motivated Cyclic Plasticity Model," ASCE Journal of Engineering Mechanics, Vol. 113, No. 3, March 1987, pp.378-397.
12. McDowell, D.L., Stock, S.R., Stahl, D., and Antolovich, S.D., "Biaxial Path Dependence of Deformation Substructure of Type 304 Stainless Steel," Metallurgical Transactions, Vol. 19A, May 1988, pp. 1277-1293.
13. DeMane, M.F, Beals, N.B., McDowell, D.L., Greenwood, K.M., and Spector, M., "Porous Polysulfone-Coated Femoral Stems," ASTM STP F4, 1986.
14. McDowell, D.L., Ho, Kwang-Il, and Staley, J., "An Anisotropic, Damage-Coupled Viscoplastic Model for Creep-Dominated Cyclic Loading," ASTM STP 995, Vol. I, A. Saxena, J.D. Landes and J.L. Bassani, Eds., 1989, pp. 173-194.
15. Leung, Chun-Pok, McDowell, D.L., and Saxena, A., "A Numerical Study of Nonsteady State Creep at Stationary Crack Tips," ASTM STP 995, Vol. I, A. Saxena, J.D. Landes and J.L. Bassani, Eds., 1989, pp. 55-67.
16. Yoder, P.Y., and McDowell, D.L., "Bounding-Surface Plasticity: Stress Space versus Strain Space," Acta Mechanica, Vol. 77, 1989, pp. 13-45.
17. Beals, N., McDowell, D., and Spector, M., "Fatigue Behavior of Porous Polysulfone Surface Coatings for Orthopaedic Applications," International Journal of Fatigue, Vol. 9, No. 4, October 1987, pp. 211-216.
18. Leung, Chun-Pok, McDowell, D.L., and Saxena, A., "Consideration of Primary Creep at a Stationary Crack Tip: Implications for the C_t Parameter," International Journal of Fracture, Vol. 36, 1988, pp. 275-289.
19. McDowell, D.L., "Evaluation of Intersection Conditions for Two Surface Plasticity Theory," International Journal of Plasticity, Vol. 5, No. 1, 1989, pp. 29-50.

20. Moosbrugger, J.C. and McDowell, D.L., "On a Class of Kinematic Hardening Rules for Nonproportional Cyclic Plasticity," ASME Journal of Engineering Materials and Technology, Vol. 111, 1989, pp. 87-98.
21. Leung, Chun-Pok and McDowell, D.L., "Inclusion of Primary Creep in the Estimation of the C_t Parameter," International Journal of Fracture, Vol. 46, 1990, pp. 81-104.
22. Moosbrugger, J.C. and McDowell, D.L., "A Rate-Dependent Bounding Surface Model with a Generalized Image Point for Cyclic Nonproportional Viscoplasticity," Journal of the Mechanics and Physics of Solids, Vol. 38, No. 5, 1990, pp. 627-656.
23. Leung, Chun-Pok, McDowell, D.L. and Saxena, A., "Estimation of the C_t Parameter: Experimental Implications," ASTM Journal of Testing and Evaluation, Vol. 18, No. 1, 1990, pp. 25-37.
24. Berard, J.Y. and McDowell, D.L., "A ΔJ -Based Approach to Biaxial Low Cycle Fatigue of Shear Damaged Materials," ESIS10 (K. Kussmaul, D. McDiarmid and D. Socie, Eds.), Mechanical Engineering Publications, London, 1991, pp. 413-431.
25. McDowell, D.L. and Moyar, G.J., "Parametric Study of Cyclic Plastic Deformation in Rolling and Sliding Line Contact with Realistic Nonlinear Material Behavior," WEAR, Vol. 144, 1991, pp. 19-37.
26. McDowell, D.L., "Bounding Surface Thermoplasticity," ASME Journal of Engineering Materials and Technology, Vol. 114, No. 3, 1992, pp. 297-303.
27. Miller, M.P., McDowell, D.L., and Oehmke, R.L.T., "A Creep-Fatigue-Oxidation Microcrack Propagation Model for Thermomechanical Fatigue," ASME Journal of Engineering Materials and Technology, Vol. 114, No. 3, 1992, pp. 282-288.
28. McDowell, D.L. and Moosbrugger, J.C., "Continuum Slip Foundations of Elasto-Viscoplasticity," Acta Mechanica, Vol. 93, 1992, pp. 73-87.
29. McDowell, D.L., "A Nonlinear Kinematic Hardening Theory for Cyclic Thermoplasticity and Thermoviscoplasticity," International Journal of Plasticity, Vol. 8, 1992, pp. 695-728.
30. McDowell, D.L. and Berard, J., "A ΔJ -Based Approach to Biaxial Fatigue," Fatigue and Fracture of Engineering Materials and Structures, Vol. 15, No. 8, 1992, pp. 719-741.
31. McDowell, D.L., Antolovich, S.D. and Oehmke, R.L.T., "Mechanistic Considerations for TMF Life Prediction of Nickel-Base Superalloys," Nuclear Engineering and Design, Vol. 133, 1992, pp. 383-399.
32. Yoon, K.B., Saxena, A. and McDowell, D.L., "Influence of Crack Tip Cyclic Plasticity on Creep-Fatigue Crack Growth," ASTM STP 1131, 1992, pp. 367-392.
33. McDowell, D.L., Marin, E. and Bertocelli, C., "A Combined Kinematic-Isotropic Hardening Theory for Porous Inelasticity of Ductile Metals," International Journal of Damage Mechanics, Vol. 2, April 1993, pp. 137-161.
34. Yoon, K.B., Saxena, A. and McDowell, D.L., "Effect of Cyclic Overload on the Crack Growth Behavior during Hold Period at Elevated Temperature," International Journal of Fracture, Vol. 59, 1993, pp. 199-211.

35. Berard, J.Y., McDowell, D.L, and Antolovich, S.D., "Damage Observation of a Low Carbon Steel Under Tension-Torsion Low Cycle Fatigue," ASTM STP 1191, 1993, pp. 326-344.
36. Miller, M.P., McDowell, D.L, Oehmke, R.L.T., and Antolovich, S.D., "A Life Prediction Model for Thermomechanical Fatigue Based on Microcrack Propagation," ASTM STP 1186, 1993, pp. 35-49.
37. McDowell, D.L., "Description of Nonproportional Cyclic Ratchetting Behavior," European Journal of Mechanics, A/Solids, Vol. 13, No. 5, 1994, pp. 593-604.
38. McDowell, D.L., "Stress State Dependence of the Cyclic Ratchetting Behavior of Two Rail Steels," International Journal of Plasticity, Vol. 11, No. 4, 1995, pp. 397-421.
39. McDowell, D.L., Miller, M.P. and Brooks, D.C., "A Unified Creep-Plasticity Theory for Pb-Sn Solder," Fatigue of Electronic Materials, ASTM STP 1153, S.A. Schroeder and M.R. Mitchell, Eds., ASTM, Philadelphia, 1994, pp. 42-59.
40. Miller, M.P. and McDowell, D.L., "The Effect of Stress-State on the Large Strain Inelastic Deformation Behavior of 304L Stainless Steel," ASME Journal of Engineering Materials and Technology, Vol. 188, No. 1, 1996, pp. 28-36.
41. Adefris, N., Saxena, A. and McDowell, D.L., "Creep-Fatigue Crack Growth Behavior in 1 Cr-1Mo-0.25V Steel. Part I - Estimation of Crack Tip Parameters," Fatigue and Fracture of Engineering Materials and Structures, Vol. 19, No. 4, 1996, pp. 387-399.
42. Adefris, N., Saxena, A. and McDowell, D.L., "Creep-Fatigue Crack Growth Behavior in 1 Cr-1Mo-0.25V Steel. Part II - Crack Growth Behavior and Models," Fatigue and Fracture of Engineering Materials and Structures, Vol. 19, No. 4, 1996, pp. 401-411.
43. Howell, M., Hahn, G.T., Rubin, C.A. and McDowell, D.L., "Finite Element Analysis of Rolling Contact for Nonlinear Kinematic Hardening Bearing Steel," ASME Journal of Tribology, Vol. 117, 1995, pp. 729-736.
44. McDowell, D.L., "An Engineering Model for Propagation of Small Cracks in Fatigue," Engineering Fracture Mechanics, Vol. 56, No. 3, 1997, pp. 357-377.
45. Lim, T.J. and McDowell, D.L., "Path Dependence of Shape Memory Alloys During Cyclic Loading," Journal of Intelligent Materials Systems and Structures, Vol. 6, 1995, pp. 817-830.
46. McDowell, D.L. and Bennett, V.P., "A Microcrack Growth Law for Multiaxial Fatigue," Fatigue and Fracture of Engineering Materials and Structures, Vol. 19, No. 7, 1996, pp. 821-837.
47. Marin, E.B. and McDowell, D.L., "Models for Compressible Elasto-Plasticity Based on Internal State Variables," International Journal of Damage Mechanics, Vol. 7, No. 1, 1998, pp. 47-83.
48. Marin, E.B. and McDowell, D.L., "Associative Versus Non-Associative Porous Viscoplasticity Based on Internal State Variable Concepts," International Journal of Plasticity, Vol. 12, No. 5, 1996, pp. 629-669.
49. Miller, M.P. and McDowell, D.L., "Modelling Large Strain Multiaxial Effects in FCC Polycrystals," International Journal of Plasticity, Vol. 12, No. 7, 1996, pp. 875-902.

50. Miller, M.P. and McDowell, D.L., "Biaxial Deformation Experiments Over Multiple Strain Regimes," in *Multiaxial Fatigue and Deformation Testing Techniques*, ASTM STP 1280, Kalluri and Bonacuse, Eds., ASTM, 1997, pp. 65-91.
51. Hamilton, B.C., Hall, D.E., Saxena, A. and McDowell, D.L., "Creep Crack Growth Behavior of Aluminum Alloy 2519: Part I - Experimental Analysis, in *Elevated Temperature Effects on Fatigue and Fracture*, ASTM STP 1297, eds. Piascik, Gangloff and Saxena, 1997, pp. 3-18.
52. Hall, D.E., Hamilton, B.C., McDowell, D.L. and Saxena, A., "Creep Crack Growth Behavior of Aluminum Alloy 2519: Part II - Numerical Analysis," in *Elevated Temperature Effects on Fatigue and Fracture*, ASTM STP 1297, eds. Piascik, Gangloff and Saxena, 1997, pp. 19-36.
53. Marin, E.B. and McDowell, D.L., "A Semi-Implicit Integration Scheme for Rate-Dependent and Rate-Independent Plasticity," *Computers and Structures*, Vol 63, No. 3, 1997, pp. 579-600.
54. McDowell, D.L., "Multiaxial Fatigue Strength," *ASM Handbook*, Vol. 19 on *Fatigue and Fracture*, ASM International, 1996, pp. 263-273.
55. McDowell, D.L., "Basic Issues in the Mechanics of High Cycle Metal Fatigue," *International Journal of Fracture*, Vol. 80, 1996, pp. 103-145.
56. Lacy, T., McDowell, D.L., Willice, P.A. and Talreja, R., "On Representation of Damage Evolution in Continuum Damage Mechanics," *International Journal of Damage Mechanics*, Vol. 6, 1997, pp. 62-95.
57. Lacy, T., McDowell, D.L. and Talreja, R., "Effects of Damage Distribution on Evolution," *Applications of Continuum Damage Mechanics to Fatigue and Fracture*, ASTM STP 1315, D.L. McDowell, Ed., 1997, pp. 131-149.
58. McDowell, D.L., "Multiaxial Small Fatigue Crack Growth in Metals," *International Journal of Fatigue*, Vol. 19, No. 1, 1997, pp. S127-S135.
59. Fu, C., McDowell, D.L., and Ume, C., "A Finite Element Procedure of a Cyclic Thermoviscoplasticity Model for Solder and Copper Interconnects," *ASME Journal of Electronic Packaging*, Vol. 120, 1998, pp. 24-34.
60. Adefris, N., McDowell, D.L. and Saxena, A., "An Alternative Analytical Approximation of the C_t Parameter," *Fatigue and Fracture of Engineering Materials and Structures*, Vol. 21, No. 4, 1998, pp. 375-385.
61. McDowell, D.L., "An Approximate Algorithm for Elastic-Plastic 2-D Rolling/Sliding Contact," *Wear*, Vol. 211, 1997, pp. 237-246.
62. Horstemeyer, M.F. and McDowell, D.L., "Modeling Effects of Dislocation Substructure in Polycrystal Elastoviscoplasticity," *Mechanics of Materials*, Vol. 27, 1998, pp. 145-163.
63. Hall, D.E., McDowell, D.L. and Saxena, A., "Crack Tip Parameters for Creep-Brittle Crack Growth," *Fatigue and Fracture of Engineering Materials and Structures*, Vol. 21, No. 4, 1998, pp. 387-401.
64. Fu, C., Ume, I.C. and McDowell, D.L., "Thermal Stress and Fatigue Analysis of Plated-Through Holes Using an Internal State Variable Constitutive Model," *Finite Elements in Analysis and Design*, Elsevier, Vol. 30, 1998, pp. 1-17.

65. Butler, G.C., Graham, S., McDowell, D.L., Stock, S.R. and Ferney, V.C., "Application of the Taylor Polycrystal Plasticity Model to Complex Deformation Experiments," ASME Journal of Engineering Materials and Technology, Vol. 120, 1998, pp. 197-205.
66. Butler, G.C. and McDowell, D.L., "Polycrystal Constraint and Grain Subdivision," International Journal of Plasticity, Vol. 14, No. 8, 1998, pp. 703-717.
67. Tanner, A.B. and McDowell, D.L., "Deformation, Temperature and Strain Rate Sequence Experiments on OFHC Copper," International Journal of Plasticity, Vol. 15, 1999, pp. 375-399.
68. Tanner, A.B., McGinty, R.D. and McDowell, D.L., "Modeling Temperature and Strain Rate Sequence Effects on OFHC Copper," International Journal of Plasticity, Vol. 15, 1999, pp. 575-603.
69. Lim, T.-J. and McDowell, D.L., "Mechanical Behavior of an Ni-Ti Shape Memory Alloy under Axial-Torsional Proportional and Nonproportional Loading," ASME Journal of Engineering Materials and Technology, Vol. 121, 1999, pp. 9-18.
70. Guvenilir, A., Butler, G.C., Haase, J.D., McDowell, D.L. and Stock, S.R., "X-ray Microbeam Quantification of Grain Subdivision Accompanying Large Deformations of Copper," Acta Materialia, Vol. 46, No. 18, 1998, pp. 6599-6604.
71. Bennett, V. and McDowell, D.L., "Polycrystal Orientation Effects on Microslip and Mixed Mode Behavior of Microstructurally Small Cracks," Mixed-Mode Crack Behavior, ASTM STP 1359, Eds. K.J. Miller and D.L. McDowell, 1999, pp. 203-228.
72. Graham, S. McDowell, D.L. and Dinwiddie, R., "In-Plane Thermal Diffusivity Measurements of Orthotropic Materials," Thermal Conductivity 24, P.S. Gaal, ed., Technomic Publishing Co., Lancaster, PA, 1999, pp. 241-252.
73. Graham, S. and McDowell, D.L., "Multi-Dimensional Flash Diffusivity Measurements of Orthotropic Materials," International Journal of Thermophysics, Vol. 20, No. 2, 1999, pp. 691-707.
74. McDowell, D.L., "Modeling and Experiments in Plasticity," special volume on Research Directions in Solid Mechanics, Ed. G.J. Dvorak, Int. Journal of Solids and Structures, Vol. 37, 2000, pp. 293-309.
75. Horstemeyer, M.F., McDowell, D.L., and McGinty, R.D., "Design of Experiments for Constitutive Model Selection: Application to Polycrystal Elastoviscoplasticity," in Modelling Simul. Mater. Eng., Vol. 7, 1999, pp.253-273.
76. Saxena, A., Hall, D.E. and McDowell, D.L., "Assessment of Deflection Rate Partitioning for Analyzing Creep Crack Growth Data," Engineering Fracture Mechanics, Vol. 62, 1999, pp. 111-122.
77. McGinty, R.D. and McDowell, D.L., "Multiscale Polycrystal Plasticity," ASME Journal of Engineering Materials and Technology, Vol. 121, 1999, pp. 203-209.
78. Lacy, T.E., McDowell, D.L. and Talreja, R., "Gradient Concepts for Evolution of Damage," Mechanics of Materials, Vol. 31, 1999, pp. 831-860.
79. McDowell, D.L., "Damage Mechanics in Metal Fatigue: A Discriminating

- Perspective,” *International Journal of Damage Mechanics*, special issue guest edited by D.L. McDowell, Vol. 8, 1999, pp. 377-403.
80. Gall, K., Yang, N., Horstemeyer, M., McDowell, D.L., and Fan, “The Influence of Modified Intermetallics and Si Particles on Fatigue Crack Paths in a Cast A356 Al Alloy,” *Fatigue and Fracture of Engineering Materials and Structures*, Vol. 23, No. 2, 2000, pp. 159-172.
 81. Gall, K., Yang, N., Horstemeyer, M., McDowell, D.L., and Fan, “The Debonding and Fracture of Si Particles During the Fatigue of a Cast Al-Si Alloy,” *Metallurgical and Materials Transactions A*, Vol. 30A, 1999, pp. 3079-3088.
 82. Gall, K., Lim, T.J., McDowell, D.L., Sehitoglu, H. and Chumlyakov, Y.I., “The Role of Intergranular Constraint on the Stress-Induced Martensitic Transformation in Textured Polycrystalline NiTi,” *International Journal of Plasticity*, Special Issue on Phase Transformation, Vol. 16, 2000, pp. 1189-1214.
 83. Morrissey, R.J., McDowell, D.L. and Nicholas, T., “Frequency and Stress Ratio Effects in High Cycle Fatigue of Ti-6Al-4V,” *International Journal of Fatigue*, Vol. 21, 1999, pp. 679-685.
 84. Morrissey, R.J., McDowell, D.L. and Nicholas, T., “Strain Accumulation in Ti-6Al-4V During Fatigue at High Mean Stress,” *Mechanics of Time-Dependent Materials*, Vol. 2, 1999, pp. 195-210.
 85. Gall, K., Horstemeyer, M., McDowell, D.L., and Fan, J. “Finite Element Analysis of the Stress Distributions Near Damaged Si Particle Clusters in Cast Al-Si Alloys,” *Mechanics of Materials*, Vol. 32, No. 5, 2000, pp. 277-301.
 86. Garber, M.A., McDowell, D.L. and Hutton, W.C., “Bone Loss During Simulated Weightlessness: A Biomechanical and Mineralization Study in the Rat Model,” *Aviation, Space and Environmental Medicine*, Vol. 71, No. 6, 2000.
 87. McDowell, D.L., Clayton, J.D. and Bennett, V.P., “Integrated Diagnostic/Prognostic Tools for Small Cracks in Structures,” *Proc. Instn. Mech. Engrs.*, Vol. 214, Part C, 2000, pp. 1123-1140.
 88. Gall, K., Horstemeyer, M.F, Degner, B.W., McDowell, D.L., and Fan, J. “On the Driving Force for Fatigue Crack Formation From Inclusions and Voids in a Cast A356 Aluminum Alloy,” *International Journal of Fracture*, Vol. 108, 2001, pp. 207-233.
 89. Graham, S., McDowell, D. L., Lara-Curzio, E., Dinwiddie, R. B., and Wang, H., “The Effects of Microstructural Damage on the Thermal Diffusivity of Continuous Fiber-Reinforced Ceramic Matrix Composites,” *Environmental, Mechanical, and Thermal Properties and Performance of Continuous Fiber Ceramic Composite (CFCC) Materials and Components*, ASTM STP 1392, M. G. Jenkins, Ed., American Society for Testing and Materials, West Conshohocken, PA, Sept. 2000, pp. 185-200.
 90. Fan, J., McDowell, D.L., Horstemeyer, M.F. and Gall, K., “Computational Micromechanics Analysis of Cyclic Crack-tip Behavior for Microstructurally Small Cracks in Dual-Phase Al-Si Alloys”, *Engineering Fracture Mechanics*, Vol. 68, 2001, pp. 1687-1706.
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92. Fu, C., McDowell, D.L. and Ume, I.C., "Thermoplastic Finite Element Analysis of Unfilled Plated-Through Holes During Wave Soldering," ASME Journal of Electronic Packaging, Vol. 124, No. 1, 2002, pp. 45-53.
93. Lim, T.J. and McDowell, D.L., "Cyclic Thermomechanical Behavior of a Polycrystalline Pseudoelastic Shape Memory Alloy," Journal of the Mechanics and Physics of Solids, Vol. 50, Issue 3, 2002, pp. 651-676.
94. Butler, G.C., Stock, S.R., McGinty, R.D. and McDowell, D.L., "X-Ray Microbeam Laue Pattern Studies of the Spreading of Orientation in OFHC Copper at Large Strains," ASME Journal of Engineering Materials and Technology, Special Issue on Micromechanics, Vol. 124, 2002, pp. 48-54.
95. Goh, C.-H., Wallace, J.M., Neu, R.W. and McDowell, D.L., "Polycrystal Plasticity Simulations of Fretting Fatigue," International Journal of Fatigue, Vol. 23, 2001, pp. S423-S435.
96. McDowell, D.L., "Materials Design: A Useful Research Focus for Inelastic Behavior of Structural Metals," Special Issue of the Theoretical and Applied Fracture Mechanics, Prospects of Mesomechanics in the 21st Century: Current Thinking on Multiscale Mechanics Problems, eds. G.C. Sih and V.E. Panin, Vol. 37, 2001, pp. 245-259.
97. Clayton, J., Schroeter, B., Graham, S. and McDowell, D.L., "Distributions of Stretch and Rotation in Polycrystalline OFHC Cu," ASME Journal of Engineering Materials and Technology, Vol. 124, No. 3, 2002, pp. 302-313.
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134. McDowell, D.L., "Multiscale Modeling of Dislocation/Disclination Mechanics: Atomistic to Continuum," Lead Presentation, Workshop on Multiscale Modeling of Materials: Mathematics and Computation, PNNL, Tacoma, WA, May 25-30, 2006.
135. Spearot, D.E., McDowell, D.L., and Jacob, K.I., Atomistic simulation of dislocation nucleation from grain boundaries in FCC metals, presented at: The 7th World Congress on Computational Mechanics, Los Angeles, CA, July 16-22, 2006.
136. Spearot, D.E., Tschopp, M.A., and McDowell, D.L., "Grain Boundary Structure and Dislocation/Disclination Mechanics in Plasticity of FCC Metals," Keynote Lecture, Plasticity 2006, Halifax, Nova Scotia, July 17-22, 2006.
137. McDowell, D.L., Shenoy, M.M., Zhang, M. and Zhang, J., "Simulation-Based Strategies for Microstructure-Sensitive Cyclic Plasticity and Fatigue Modeling," Plasticity 2006, Halifax, Nova Scotia, July 17-22, 2006.
138. Zhang, M., Zhang, J., and McDowell, D.L., "Microstructure-scale Modeling of Mechanical Deformation of Ti-6Al-4V Based on Computational Crystal Plasticity," "43rd Annual Technical Meeting of the Society of Engineering Science, Penn State, State College, PA, August 13-16, 2006.
139. McDowell, D.L., "Multiscale Computational Modeling for Materials Design," STEP Computational Materials Science Workshop, MITRE Corp., McLean, VA, Aug. 16-17, 2006.
140. McDowell, D.L., "Multiscale characterization, modeling and design of alloy systems," Metz/Nancy Workshop on Potential Collaborations, Nancy, France, Sept. 6-7, 2006.
141. McDowell, D.L., "Materials Research at Georgia Tech: A Materials Council Perspective," Metz/Nancy Workshop on Potential Collaborations, Nancy, France, Sept. 6-7, 2006.

142. McDowell, D.L., "Simulation and Robust Design of Materials," TMS MS&T 2006, Cincinnati, OH, Oct. 14-18, 2006.
143. McDowell, D.L., "Simulation and Design of Multifunctional Energetic Structural Materials," AFOSR Metallic Materials Grantees Meeting, Arlington, VA, Nov. 1-3, 2006.
144. McDowell, D.L., "A Perspective on Socie's Influence on Approaches to Address Fatigue of Materials," Workshop on Advances in Fatigue Assessment Technology: Honoring Professor Socie, Sponsored by ASTM Committee E08 on Fatigue and Fracture, ASTM Fall meeting, November 16, 2006.
145. Austin, R.A., Eakins, D., McDowell, D.L., Thadhani, N.N. and Benson, D.J., "Shock Compression of Ni+Al Particle Systems Part II: Modeling and Simulation," Symp. on Dynamic Behavior of Materials, TMS Annual Meeting & Exhibition, Orlando, FL, Feb. 25-March 1, 2007.
146. McDowell, D.L., Prasanna, R., Salajegheh, N., and Zhang, J., "3D Modeling of Fatigue Crack Nucleation at Primary Inclusions," DARPA Prognosis PI Meeting, St. Augustine, FL. January 29, 2007.
147. McDowell, D.L., Tjiptowidjojo, Y. and Przybyla, C., "Physics-based prognostic tools for fatigue of propulsion system materials," DARPA Prognosis PI Meeting, St. Augustine, FL. January 29, 2007.
148. Liu, Z.-K. and McDowell, D.L., "Overview of the Center for Computational Materials Design (CCMD)," Symp. On Integrated Computational Materials Engineering, TMS Annual Meeting & Exhibition, Orlando, FL, Feb. 25-March 1, 2007.
149. Bammann, D.J., Mayeur, J., and McDowell, D.L., "An Internal State Variable Model of Micropolar Elasto-Viscoplasticity," Symp. in Honor of Dr. Craig Hartley's 40 years of Contributions to the Field of Mechanics and Materials Science, TMS Annual Meeting & Exhibition, Orlando, FL, Feb. 25-March 1, 2007.
150. Austin, R.A., McDowell, D.L., and Benson, D.J., "Shock Compression of Ni+Al Particle Systems: Modeling and Simulation," Symp. On Dynamic Behavior of Materials: Mechanical Properties, TMS Annual Meeting and Exhibition, Orlando, FL, Feb. 25-March 1, 2007.
151. McDowell, D.L., "Multiscale Modeling and Microstructure-Property Relations in Materials Design," 17th US Army Symposium on Solid Mechanics, Baltimore, April 2-5, 2007.
152. Allen, J.K., Muchnick, H., Messer, M., McDowell, D.L. and Mistree, F., "Simulation and Template-Based Robust Design of Blast Resistant Panels, 17th US Army Symposium on Solid Mechanics, Baltimore, MD, April 4, 2007.
153. Xue, Y., Wright, A., Solanki, K., Horstemeyer, M.F., and McDowell, D.L., "Micromechanical Simulation of Cyclic Plasticity at Inclusion Particles with Pre-over Straining," 48th AIAA Structural Dynamics and Materials Conference, Honolulu, Hawaii, April 23-26 2007.
154. Tschopp, M.A. and McDowell, D.L. "Atomistic simulations of dislocation nucleation in asymmetric tilt grain boundaries," Plasticity 2007, Girdwood, Alaska, USA, June 2-6, 2007.

155. Tjiptowidjojo, Y., Shenoy, M. and McDowell, D.L., “Microstructure-sensitive constitutive models for Ni-base superalloys,” Plasticity 2007, Girdwood, Alaska, USA, June 2-6, 2007.
156. Austin, R.A., McDowell, D.L, Horie, Y., and Benson, D.J., “A Study of Reactant Interfaces in Ni+Al Particle Systems During Shock Wave Propagation,” 15th APS Topical Conference on Shock Compression of Condensed Matter, Kohala Coast, Hawaii, June 24–29, 2007.
157. Prasannavenkatesan, R. and McDowell, D.L., “Effect of Residual Stresses on Fatigue Crack Nucleation at Nonmetallic Primary Inclusions in High Strength Steels,” ASME Applied Mechanics and Materials Conference, Austin, TX. June 3-7, 2007.
158. Prasannavenkatesan, R., Zhang, J. and McDowell, D.L., “3D Modeling of Potency for Fatigue Crack Nucleation at Primary Inclusions in Carburized and Shot Peened Gear Steels,” Very High Cycle Fatigue Conference, Ann Arbor, MI, Aug. 19-22, 2007.
159. Przybyla, C. Salageheh, N., Prasanna, R. and McDowell, D.L., “Micromechanical Modeling of High Cycle Fatigue Processes,” 2007 ASM/TMS Symposium on Computational Materials Design, GE Global Research, Niskayuna, NY, August 20-21, 2007.
160. DiPrima, M., Lesniewski, M., Gall, K., McDowell, D.L., Sanderson, T., and Campbel, D., “Characterization of Epoxy Shape Memory Foams,” 44th Annual Technical Meeting, Society of Engineering Science, October 21-24, 2007.
161. Tschopp, M.A., Tucker, G., Mayeur, J. and McDowell, D.L., “Grain Boundary Structure, Properties and Implications for Dislocation/Disclination Mechanics in FCC Metals,” IUTAM Symposium on Multiscale Plasticity of Crystalline Materials, TU/e, Eindhoven, The Netherlands, November 5-9, 2007.
162. Prasanna, R.. and McDowell, D.L., “A Micromechanical Approach to Model Residual Stress Relaxation and Fatigue Crack Nucleation in High Strength Gear Steels,” ASME International Mechanical Engineering Congress and Exposition Seattle, Washington, November 10-15, 2007.
163. McDowell, D.L., “A Perspective on Trends in Multiscale Plasticity,” 14th International Symposium on Plasticity and Its Current Applications, Kona, Hawaii, Jan. 3-8, 2008 (Plenary Lecture).
164. Alley, E.S., Prasanna, R., Neu, R.W., and McDowell, D.L., ”Modeling Rolling Contact Fatigue of Bearing Steels with Inclusions,” 14th International Symposium on Plasticity and Its Current Applications, Kona, Hawaii, Jan. 3-8, 2008.
165. Zhang, M., McDowell, D.L., and Neu, R.W., “Microstructure-based Modeling: Application to Fretting Fatigue,” 14th International Symposium on Plasticity and Its Current Applications, Kona, Hawaii, Jan. 3-8, 2008.
166. McDowell, D.L., “Multiscale Modeling and Materials Design,” TMS 2008 9th Global Innovations Symposium on Trends in ICME, New Orleans, LA, March 9-13, 2008.
167. Tschopp, M.A. Tiwari, S., Ghosh, S., and McDowell, D.L., “Influence of Grain Boundary Character on Nanocrystalline Plasticity,” TMS 2008 Hael Mughrabi

- Honorary Symposium on Plasticity, Failure and Fatigue in Structural Materials, New Orleans, LA, March 9-13, 2008.
168. Tschopp, M.A. and McDowell, D.L., "Atomistic Simulations of Grain Boundary Dislocation Nucleation," TMS 2008 Hael Mughrabi Honorary Symposium on Plasticity, Failure and Fatigue in Structural Materials, New Orleans, LA, March 9-13, 2008.
 169. Tschopp, M.A., Medlin, D. and McDowell, D.L., "Dislocation Nucleation at the Vicinal Coherent Twin in FCC Cu and Al" TMS 2008 Symposium on Deformation Twinning, New Orleans, LA, March 9-13, 2008.
 170. Tucker, G., Tschopp, M.A. and McDowell, D.L., "Atomistic Simulations of Dislocation Nucleation in Copper Grain Boundaries under Uniaxial Tension and Compression," TMS 2008 Hael Mughrabi Honorary Symposium on Plasticity, Failure and Fatigue in Structural Materials, New Orleans, LA, March 9-13, 2008.
 171. Przybyla, C. and McDowell, D.L., "Using Marked and Unmarked Correlations to Investigate Interactions of Microstructure Attributes in Fatigue of Titanium Alloys and Nickel Superalloys," TMS 2008 Hael Mughrabi Honorary Symposium on Plasticity, Failure and Fatigue in Structural Materials, New Orleans, LA, March 9-13, 2008.
 172. Przybyla, C., Salageheh, N., Prasannavenkatesan, R., and McDowell, D.L., "Microstructure-Sensitive Modeling of High Cycle Fatigue," International Conference on Heterogeneous Material Mechanics, Huangshan, China, June 3-8, 2008.
 173. McDowell, D.L., "Comments on Multiscale and Multi-physics Modeling," International Conference on Heterogeneous Material Mechanics, Huangshan, China, June 3-8, 2008.
 174. McDowell, D.L., "Comments on Stochastic Microstructure Evolution and Degradation," International Conference on Heterogeneous Material Mechanics, Huangshan, China, June 3-8, 2008.
 175. McDowell, D.L., and Prasanna, R., "3D Modeling of Fatigue in Hierarchical Martensitic Steel Microstructures," ONR D 3-D Digital Structure Review Meeting, Sept. 8-12, 2008.
 176. Xue, Y., Jordon, J.B., Horstemeyer, M.F., McDowell, D.L., and Newman, J. "Prognosis for structural health prognosis using mechanistic multistage fatigue model," Int. Conf. on Fatigue Damage of Structural Materials VII, Hyannis, MA, Sept. 14-19, 2008.
 177. McDowell, D.L., "Selected Gaps and Opportunities: Multiscale Plasticity and Materials Design," Army Research Laboratory Workshop: Multi-Scale Materials Behavior in Ultra-High Loading Rate Environments," Towson, MD, Sept. 22-24, 2008.
 178. Tschopp, M.A., Tucker, G., and McDowell, D.L., "Overview of Recent Results in Simulation of Dislocation Nucleation," poster, MS&T '08, Pittsburgh, PA, Oct. 5-9, 2008.
 179. Przybyla, C., Prasannavenkatesan, R., Salageheh, N., and McDowell, D.L., "Microstructure-Sensitive Modeling of High Cycle Fatigue," Symposium on

- Fatigue of Materials: Competing Failure Modes and Variability in Fatigue Life, MS&T '08, Pittsburgh, PA, Oct. 5-9, 2008.
180. Przybyla, C. and McDowell, D.L., "Extreme Value Marked Correlation Statistics in HCF of Ti-6Al-4V," Symposium on Fatigue of Materials: Competing Failure Modes and Variability in Fatigue Life, MS&T '08, Pittsburgh, PA, Oct. 5-9, 2008.
 181. Tschopp, M.A. and McDowell, D.L., "Asymmetric Tilt Grain Boundary Structure and Energy in Copper and Aluminum," Session on Ceramic Surfaces, Grain Boundaries and Interfaces, MS&T '08, Pittsburgh, PA, Oct. 5-9, 2008.
 182. McDowell, D.L., "Robust Simulation-Based Design of Materials," Symposium on Computational Materials Design, 4th International Conference on Multiscale Materials Modeling (*MMM 2008*), Tallahassee, FL, Oct. 29, 2008.
 183. McDowell, D.L., "Selective GT Overview: Materials Design for Transportation and Energy Applications," Workshop on GT-IIT KGP Alliance Product Creation Network, IIT Kharagpur, India, November 19, 2008.
 184. McDowell, D.L., "Multiscale Modeling in Multilevel Materials Design," Kickoff Lecture, Symposium on Computational Materials Design via Multiscale Modeling, Session on New Approaches Toward Multiscale Materials Design, MRS Fall Meeting, Boston, MA, Dec. 1, 2008.
 185. DiPrima, M., Gall, K., McDowell, D.L., Sanderson, T., Arzberger, S. and Campbell, D., "Characterization of the Damage Mechanisms in Epoxy Shape Memory Polymer Foam during Cyclic Deformation," Symp. on Polymer-Based Smart Materials-Process, Properties, and Application, MRS Fall Meeting, Boston, MA, Dec. 5, 2008.
 186. McDowell, D.L., "MAI Durable High Temperature Disk Materials PW-7," presented to Hybrid Disk Workshop, TecEdge, Dayton, Ohio December 15, 2008.
 187. Luscher, D.J., McDowell, D.L., and Bronkhorst, C.A., "A Hierarchical Multiscale Framework for Modeling Microstructure Evolution," Plasticity 2009, the 15th International Symposium on Plasticity and its Current Applications, St. Thomas, Virgin Islands, January 3-8, 2009.
 188. Austin, R.A. and McDowell, D.L., "A Model for the Strength of FCC Polycrystals in the Shock Loading Regime," Plasticity 2009, the 15th International Symposium on Plasticity and its Current Applications, St. Thomas, Virgin Islands, January 3-8, 2009.
 189. Tschopp, M.A. and McDowell, D.L., "Tension-Compression Asymmetry in Homogeneous Dislocation Nucleation in Single Crystal Copper," Plasticity 2009, the 15th International Symposium on Plasticity and its Current Applications, St. Thomas, Virgin Islands, January 3-8, 2009.
 190. Mayeur, J., Bammann, D.J., and McDowell, D.L., "A Micropolar Model of Crystal Plasticity with Enhanced Description of Grain Boundaries," Plasticity 2009, the 15th International Symposium on Plasticity and its Current Applications, St. Thomas, Virgin Islands, January 3-8, 2009.
 191. Alley, E.S., Prasannavenkatesan, R., Neu, R.W., and McDowell, D.L., "A Micromechanical Model with Crystal Plasticity and Phase Transformation in

- 41100 Steel,” Plasticity 2009, the 15th International Symposium on Plasticity and its Current Applications, St. Thomas, Virgin Islands, January 3-8, 2009.
192. Zimmerman, J.A., Tucker, G.J. and McDowell, D.L., “Atomic-Scale Deformation Kinematics for Simulations of Dislocation Nucleation and Bicrystal Grain Boundary Evolution,” TMS 2009 Annual Meeting, San Francisco, CA, February 15-19, 2009.
 193. Przybyla, C., Prasannavenakatesan, R., Salajegheh, N., and McDowell, D.L., “Microstructure-Sensitive Modeling of High Cycle Fatigue,” TMS 2009 Annual Meeting, San Francisco, CA, February 15-19, 2009.
 194. McDowell, D.L. and Liu, Z.-K., “Center for Computational Materials Design,” Timken Modeling Summit, March 19, 2009.
 195. McDowell, D.L. and Prasanna, R., “3D Modeling of Fatigue in Hierarchical Martensitic Steel Microstructures,” Steel Research Group Meeting overview of ONR D3D program, Northwestern University, Evanston, IL, March 23-24, 2009.
 196. McDowell, D.L., “Integrated Materials and Product Design in Energy Related Applications,” GWU School of Mechanical Engineering Workshop on Sustainable Energy Pathways and Solutions, Atlanta, GA, April 2-3, 2009.
 197. McDowell, D.L., “Computational Materials Design,” Joint ME/BME Workshop on Campus-Wide Bioengineering Activities, Georgia Tech, Atlanta, GA, April 27, 2009.
 198. Przybyla, C., Shenoy, M., Tjiptowidjojo, Y., and McDowell, D.L., “Microstructure-Sensitive Constitutive Relations for Prognosis and Location-Specific Design,” AEROMAT 2009, Dayton, OH, June 8-11, 2009.
 199. McDowell, D.L. and Zhu, T., “Multiresolution, Coarse-Grained Modeling of 3D Dislocation Nucleation and Migration,” NSF CMMI Research and Innovation Conference 2009, Honolulu, HI, June 22-25, 2009.
 200. McDowell, D.L., and Prasanna, R., “3D Microstructure-Sensitive Hierarchical Fatigue Modeling of Martensitic Gear Steels,” ONR D3-D Digital Structure Review Meeting, Arlington, VA, July 7-9, 2009.
 201. McDowell, D.L., “Multiscale Strengthening Mechanisms of UHPC/rpc For Enhanced Blast/Penetration Resistance Against IEDs,” ERDC/DHS kickoff meeting, Georgia Tech, July 10, 2009.
 202. Przybyla, C.P. and McDowell, D.L., “Microstructure-Sensitive Extreme Value Probabilities of Fatigue in Advanced Engineering Alloys,” 10th US National Congress on Computational Mechanics, Columbus, OH, July 16-19, 2009.
 203. McDowell, D.L., “Materials at Georgia Tech: Materials Council Perspective,” Division of Homeland Security Site Visit on Project on cIED Effects in Materials and Materials Research at Georgia Tech, August 14, 2009.
 204. McDowell, D.L., “Hierarchical Metal Plasticity and Materials Design,” 1st International Conference on Material Modelling, Dortmund, Germany, September 15-17, 2009.
 205. Bridier, F., Villechaise, and McDowell, D.L., “Crystal plasticity modeling of slip activity in Ti-6Al-4V alloy under high cycle fatigue loading: crystallographic aspects at different scales,” 1st International Conference on Material Modelling, Dortmund, Germany, September 15-17, 2009.

206. Przybyla, C.P., Salajegheh, N., Luscher, D.J., and McDowell, D.L., "Accounting for Higher Order Moments of Response Functions to Augment Stereological Characterization," MS&T 2009, Pittsburgh, OH, October 26, 2009.
207. Tucker, G.J., Tschopp, M.A., and McDowell, D.L., "Structure and Dislocation Nucleation in FCC GB Interfaces," MS&T 2009, Pittsburgh, OH, October 28, 2009.
208. Liu, Z.-K. and McDowell, D.L., "Materials Research Paradigm Driven by Computation," MS&T 2009, Pittsburgh, OH, October 28, 2009.
209. McDowell, D.L., "Some Comments on Materials Design Education," MS&T 2009, Pittsburgh, OH, October 29, 2009.
210. Garritt, G.J. and McDowell, D.L., "Atomistic Simulations of Structure and Dislocation Nucleation at Equilibrium and Non-Equilibrium Bicrystal Boundaries," Symposium 12-7, Multiphysics Simulations for Solids, 2009 ASME IMECE, Orlando, FL, Nov. 15-19, 2009.
211. Shenoy, M., Tjiptowidjojo, Y., Przybyla, C. and McDowell, D.L., "Hierarchical Multiscale Microstructure-Sensitive Constitutive Relations for Location-Specific Fatigue Design, Symposium 1-4, Structure and Materials for Aerospace and Lightweight Structures, 2009 ASME IMECE, Orlando, FL, Nov. 15-19, 2009.
212. Prasannavenakatesan, R. and McDowell, D.L., "Microstructure-Sensitive Modeling of High Cycle Fatigue in Gear Steels," Symposium 12-32, Advances in Fatigue and Damage, 2009 ASME IMECE, Orlando, FL, Nov. 15-19, 2009.
213. Owolabi, M.G. and McDowell, D.L., "Microstructure-Sensitive Fatigue Design for Notched Components," Symposium 12-32, Advances in Fatigue and Damage, 2009 ASME IMECE, Orlando, FL, Nov. 15-19, 2009.
214. Tschopp, M.A., Spearot, D.E., and McDowell, D.L., "Molecular Dynamics Simulation of Homogeneous Nucleation of Dislocations in Single Crystals," Symposium 12-6, Modeling at Atomic/Molecular Scale, 2009 ASME IMECE, Orlando, FL, Nov. 15-19, 2009.
215. McDowell, D.L., "Global and Local Issues in Modeling Metallic Polycrystals," MRS Fall Meeting, Boston, MA, Nov. 30-Dec. 2, 2009.
216. Musinski, W. and McDowell, D.L., "Novel Methods for Microstructure-Sensitive Probabilistic Fatigue Notch Factor," Pratt & Whitney/GT Center of Excellence Semi-Annual Review Meeting, East Hartford, CT, Dec. 15, 2009.
217. Tucker, G. and McDowell, D.L., "Probing Non-Equilibrium Grain Boundary Plasticity at the Nanoscale with Atomistic Simulations," Plasticity 2010, the 16th International Symposium on Plasticity and its Current Applications, St Kitts Island, Jan. 3-8, 2010.
218. Mayeur, J. and McDowell, D.L., "A Comparison of Micropolar and Slip Gradient-Based Approaches to Single Crystal Plasticity," Plasticity 2010, the 16th International Symposium on Plasticity and its Current Applications, St Kitts Island, Jan. 3-8, 2010.
219. Luscher, D.J., McDowell, D.L., and Bronkhorst, C., "Essential Features of General Boundary Conditions for Second-Gradient Homogenization of Statistical Volume Elements," Plasticity 2010, the 16th International Symposium on Plasticity and its Current Applications, St Kitts Island, Jan. 3-8, 2010.

220. Luscher, D. and McDowell, D.L., "Multiscale Modeling of Evolving Microstructure," Plasticity 2010, the 16th International Symposium on Plasticity and its Current Applications, St Kitts Island, Jan. 3-8, 2010.
221. Przybyla, C. and McDowell, D.L., "Microstructure-Sensitive Extreme Value Probabilities of Fatigue in Advanced Engineering," Plasticity 2010, the 16th International Symposium on Plasticity and its Current Applications, St Kitts Island, Jan. 3-8, 2010.
222. McDowell, D.L., "Overview of Recent Crystal Plasticity Modeling Efforts at Georgia Tech," Rolls-Royce North America Workshop on Crystal Plasticity, Indianapolis, IN, January 11-12, 2010.
223. Tucker, G.J. and McDowell, D.L., "Dislocation Nucleation and Re-Ordering of Bicrystal Interfaces," Vasek Vitek Honorary Symposium on Crystal Defects, Computational Materials Science and Applications: Dislocations I, TMS 2010, Seattle, WA, Feb. 14-18, 2010.
224. Musinski, W. and McDowell, D.L., "Novel Methods for Microstructure-Sensitive Probabilistic Fatigue Notch Factor," TMS 2010, Seattle, WA, Feb. 14-18, 2010.
225. McDowell, D.L., "Distinguishing Statistical and Representative Volume Elements in Structure-Property Simulations," Symposium on Three-Dimensional Materials Science VI: 3D Representative Volume Elements and Simulated Microstructure, TMS 2010, Seattle, WA, Feb. 14-18, 2010.
226. Wang, W., Zhong, Y., Tucker, G., Lu, K., Lu, L., McDowell, D.L., and Zhu, T., "Dislocation Nucleation, Jerky Flow and Size Effects in Nanoindentation," Symposium on Modeling, Simulation and Theory of Nanomechanical Materials Behavior: Nanoindentation and Contact Mechanics, TMS 2010, Seattle, WA, Feb. 14-18, 2010.
227. McDowell, D.L., "Overview: Crystal Plasticity for α - β Ti alloys," Boeing Workshop on Ti Multiscale Modeling and Simulation Workshop, Seattle, WA, Feb. 18, 2010.
228. McDowell, D.L., Prasanna, R., and Salajegheh, N., "3D Modeling of Fatigue in Hierarchical Martensitic Steel Microstructures," Steel Research Group Meeting overview of ONR D3D program, Northwestern University, Evanston, IL, March 22-23, 2010.
229. McDowell, D.L., "Plasticity at Multiple Scales," keynote lecture, 4th US-France Symposium, ICACM-2010, Scale transition for plastic crystalline and microstructured materials: from experiment to numerical modeling, June 2-4, 2010.
230. Prasannavenkatesan, R. and McDowell, D.L., "Microstructure-Sensitive Modeling of High Cycle Fatigue in Martensitic Gear Steels," keynote lecture, Fatigue 2010, Prague, Czech Republic, June 7-10, 2010.
231. McDowell, D.L. and Garmestani, H., "Multiscale Modeling and Microstructure-Sensitive Materials Design," plenary lecture, 47th Sagamore Army Materials Research Conference on Advanced Lightweight Metals Technology, St. Michaels, MD, June 14-17, 2010.

232. Musinski, W. and McDowell, D.L., "Novel Methods for Microstructure-Sensitive Probabilistic Fatigue Notch Factor," Pratt & Whitney/GT Center of Excellence Semi-Annual Review Meeting, East Hartford, CT, June 23, 2010.
233. McDowell, D.L., "Biased Sampling for Statistical Volume Elements for Evolutionary Structure-Property Relations," 20th International Workshop on Computational Mechanics of Materials, Loughborough University, UK, September 8-11, 2010, kickoff plenary speaker.
234. McDowell, D.L., "Robust Materials Design and Multiscale Simulation: Distinct but Complementary Pursuits," invited presentation, Tools, Models, Databases and Simulation Tools Developed and Needed to Realize the Vision of ICME: Material Model and Simulation Tools, Part II, MS&T 2010, Houston, TX, Oct. 19, 2010.
235. McDowell, D.L., "Critical Path Issues in ICME," invited presentation, Tools, Models, Databases and Simulation Tools Developed and Needed to Realize the Vision of ICME: Panel Discussion on Barriers to ICME and How to Overcome It, MS&T 2010, Houston, TX, Oct. 20, 2010.
236. Tucker, G., Tiwari, S., and McDowell, D.L., "Interfacial Mechanisms in Deformation of Nanocrystalline Copper Using MD Simulations and Continuum Kinematic Filters," Plasticity 2011, the 17th International Symposium on Plasticity and its Current Applications, Puerto-Vallarta, Mexico, Jan. 3-8, 2011.
237. Mayeur, J. and McDowell, D.L., "Nonlocal Crystal Plasticity Simulations of Bicrystal Deformation," Plasticity 2011, the 17th International Symposium on Plasticity and its Current Applications, Puerto-Vallarta, Mexico, Jan. 3-8, 2011.
238. Lloyd, J.T. and McDowell, D.L., "Distinguishing Grain Core and Slip Mantle Activities," Plasticity 2011, the 17th International Symposium on Plasticity and its Current Applications, Puerto-Vallarta, Mexico, Jan. 3-8, 2011.
239. Luscher, D.J., McDowell, D.L., and Bronkhorst, C.A., "Influence of the Coarse-Scale Boundary Value Problem on Length Scale Parameters for Second Gradient Continuum Theories," Plasticity 2011, the 17th International Symposium on Plasticity and its Current Applications, Puerto-Vallarta, Mexico, Jan. 3-8, 2011.
240. McDowell, D.L., "Statistical Sampling in Volume Elements for Evolutionary Structure-Property Relations," International Workshop on Advanced Problems of Mechanics and Physics of Mesoscopic Systems, Perm, Russia, Feb. 1-4, 2011.
241. Tucker, G., Tiwari, S. and McDowell, D.L., "Multilevel Atomistic Modeling of Grain Boundaries and Nanocrystals," TMS 2011, San Diego, CA, Feb. 27-March 3, 2011.
242. Musinski, W. and McDowell, D.L., "Microstructure-Sensitive Probabilistic Fatigue Modeling of Notched Components," TMS 2011, San Diego, CA, Feb. 27-March 3, 2011.
243. Huang, S., McDowell, D.L., Zhu, T., "Nano-Chemo-Mechanics of Hydrogen Embrittlement under Extreme Loading Conditions," TMS 2011, San Diego, CA, Feb. 27-March 3, 2011.
244. McDowell, D.L., "RVE identification and Homogenization, Upscaling Constitutive Relations," NSF Workshop on Challenges in Computational Multiscale Materials Modeling (CCMMM), Arlington, VA, May 4, 2011.

245. McDowell, D.L., "Biased Sampling in Elements for Evolutionary Structure-Property Relations," ICHMM 2011, Shanghai, China, May 22-26, 2011.
246. McDowell, D.L., "Fundamental Challenges: Crystal Plasticity of Microstructures," ICHMM 2011, Shanghai, China, May 22-26, 2011.
247. Tucker, G.J., Tiwari, S., Zimmerman, J., and McDowell, D.L., "Resolving Deformation Modes of Nanocrystalline Metals using Continuum Metrics Based on Atomistic Simulations", ICHMM 2011, Shanghai, China, May 22-26, 2011.
248. Mayeur, J., Bammann, D.J., and McDowell, D.L., "Heterogeneous Deformation of Polycrystals Simulated with Micropolar Single Crystal Plasticity", ICHMM 2011, Shanghai, China, May 22-26, 2011.
249. Patra, A. and McDowell, D.L., "Crystal Plasticity Modeling of Radiation Damage in BCC Structural Materials," ANS Annual Meeting, Hollywood, FL, June 26-30, 2011.
250. McDowell, D.L., "Mesoscopic Simulation in Microstructure-Sensitive VHCF," Keynote Lecture, 5th International Conference on Very High Cycle Fatigue, Berlin, Germany, June 28-30, 2011.
251. Castelluccio, G.M. and McDowell, D.L., "Effect of a deformation band on crack tip displacement simulations under cyclic loading," 5th International Conference on Very High Cycle Fatigue, Berlin, Germany, June 28-30, 2011.
252. Przybyla, C. and McDowell, D.L., "Microstructure-Sensitive Extreme Value Probabilities of HCF for Surface vs. Subsurface Crack Formation in Duplex Ti-6Al-4V, 5th International Conference on Very High Cycle Fatigue, Berlin, Germany, June 28-30, 2011.
253. Zimmerman, J.A., Jones, R.E., Zhou, X., Lloyd, J.T., and McDowell, D.L., "Application of an Atomistically-Derived Cohesive Model of Brittle Fracture," 11th US National Congress on Computational Mechanics, Minneapolis, MN, July 26, 2011.
254. Mayeur, J., Bammann, D.J., and McDowell, D.L., "Dislocation Density Based Micropolar Single Crystal Plasticity," ICMM2, Paris (Ecole des Mines), Aug. 31-Sept. 2, 2011.
255. Tucker, G.J., Tiwari, S., Zimmerman, J., and McDowell, D.L., "Deformation Modes in Nanocrystalline Materials," ICMM2, Paris (Ecole des Mines), Aug. 31-Sept. 2, 2011.
256. Tucker, G.J., Tiwari, S., Zimmerman, J., and McDowell, D.L., "Evolution of Microstructure in the Deformation of Nanocrystalline Metals," SES 2011, 48th Annual Technical Conference of the Society of Engineering Science, Northwestern University, Evanston, IL, Oct. 12, 2011.
257. McDowell, D.L., "Emerging Trends in Concurrent Material and Product Design," GTRI Workshop on the White House Materials Genome Initiative, Oct. 14, 2011.
258. Przybyla, C., Salajegheh, N., Musinski, W., and McDowell, D.L., "Microstructure-Sensitive HCF and VHCF Simulations," MS&T 2011, Columbus, OH, Oct. 17, 2011.
259. McDowell, D.L., "A Perspective on the Materials Genome Initiative," Core University Materials Genome Initiative Workshop, ORNL, Oak Ridge, TN, Oct. 26, 2011.

260. McDowell, D.L., "Dislocation Nucleation, Slip Activation, Interface Mediation and Size Effects," Workshop on Complex Dynamics of Dislocations, Defects, and Interfaces, LANL, Los Alamos, New Mexico, Nov. 14-16, 2011.
261. Mayeur, J.R., Mourad, H.M., Beyerlein, I.J., McDowell, D.L., Bammann, D.J. "Dislocation-based Micropolar Crystal Plasticity with Evolving Length Scales," ASME IMECE, Denver, CO, November 11-17, 2011.
262. Tucker, G.J., Tiwari, S., and McDowell, D.L., "Quantifying Deformation Mechanisms in Nanocrystalline Metals," Plasticity 2012, the 18th International Symposium on Plasticity and its Current Applications, San Juan, Puerto Rico, Jan. 3-8, 2012.
263. McDowell, D.L., "Microstructure-Sensitive Computational Methods in Multiaxial Fatigue," 2nd Multiaxial Fatigue Summit, St. Petersburg, FL, February 2-3, 2012.
264. Ellis, B., Zhou, M., and McDowell, D.L., "Energy Dissipation and Strength Evolution of Ultra-High-Performance Fiber-Reinforced Concrete (UHPFRC)," 3rd International Symposium on Ultra-High Performance Concrete and Nanotechnology for High Performance Construction Materials (2012 HiPerMat), Kassel, Germany, March 7-9, 2012.
265. Przybyla, C. and McDowell, D.L., "Computational Indicators for Structure-Fatigue Property Relations in Ti Alloys," Symposium on Titanium: Advances in Processing, Characterization and Properties: Mechanical Properties, TMS Annual Meeting 2012, Orlando, FL, March 12-16, 2012.
266. McDowell, D.L., "Simulation-Based Strategies to Support Alloy Design for Fatigue Resistance," Symposium on Integrative Materials Design: Performance and Sustainability, TMS Annual Meeting 2012, Orlando, FL, March 12-16, 2012.
267. Tucker, G.J., Tewari, S., Zimmerman, J., and McDowell, D.L., "Resolving the Contribution of Interfaces in the Deformation of Nanocrystalline Copper with Atomistic Simulations," TMS Annual Meeting 2012, Orlando, FL, March 12-16, 2012.
268. McDowell, D.L., "Materials Genome Initiative: Implications for University Education and Research," invited speaker, Materials Genome Town Hall Meeting, Brown University, Providence, RI, March 28, 2012.
269. McDowell, D.L., "Multiscale Modeling and Microstructure-Sensitive Materials Design," 3rd Symposium of Predictive Science and Technology of Mechanics of Materials, CAVS, Mississippi State University, Starkeville, MS, June 25-28, 2012.
270. Song, J. and McDowell, D.L., "Grain Scale Crystal Plasticity Model with Slip and Microtwinning for a Third Generation Ni-Base Superalloy," Superalloys 2012, Champion, PA, Sept. 9-12, 2012, pp. 159-166.
271. Castelluccio, G.M. and McDowell, D.L., "Fatigue Life Prediction at a Microstructural Scale: From Subgrains to Multiple Grains," International Conference on *Fatigue* Damage of *Structural* Materials IX, Hyannis, MA, September 16-21, 2012.
272. Mayeur, J. and McDowell, D.L., "Micropolar Crystal Plasticity at the Micron Scale," International Workshop on Computational Mechanics of Materials, IWCMM XXII, Baltimore, MD, September 24-26, 2012.

273. McDowell, D.L., "Using Computational Mechanics to Quantify Fatigue of Metals," Plenary Lecture, International Workshop on Computational Mechanics of Materials, IWCMX XXII, Baltimore, MD, September 24-26, 2012.
274. Lloyd, J.T. and McDowell, D.L., "Incorporating Limited Slip into Crystal Plasticity to Improve Stress-Strain and Texture Prediction," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
275. Priddy, M. and McDowell, D.L., "The Use of Crystal Plasticity Finite Element Method to Investigate Slip and Twinning in Pure Magnesium," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
276. Patra, A. and McDowell, D.L., "Modeling Localized Deformation in Irradiated BCC Metals using Continuum Crystal Plasticity," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
277. Xiong, L., McDowell, D.L., and Chen, Y., "Concurrent Atomistic-Continuum Simulation of Phonon Transport in Silicon," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
278. Ellis, B.D., Zhou, M., and McDowell, D.L., "Multiscale Modeling of Ultra-High-Performance Fiber-Reinforced Concrete Subject to Blast Loading," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
279. Tiwari, S., Tucker, G.J., and McDowell, D.L., "Simulated Isosurfaces of Inelastic Strain and Dissipation in Nanocrystalline Cu," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
280. Tucker, G.J., Tiwari, S., and McDowell, D.L., "Exploring Interfacial-Mediated Plasticity and the Deformation Mechanisms in Nanocrystalline Materials," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
281. Ellis, B.D., McDowell, D.L., and Zhou, M., "Design of Ultra-High-Performance Fiber-Reinforced Concrete to withstand Blast Loading" 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
282. Castelluccio, G.M. and McDowell, D.L., "Fatigue Stage I/II Transition at a Microstructural Scale," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
283. Musinski, W. and McDowell, D.L., "Modeling the Effects of Shot-Peened Residual Stresses on Microstructure-Sensitive Fatigue of Ni-Base Superalloy Components," 49th Annual Technical Meeting of the Society of Engineering Science, Atlanta, GA, October 10-12, 2012.
284. McDowell, D.L., "Gaps in Modeling Multiscale Plasticity," ASME IMECE, Houston, TX, November 11-14, 2012.
285. McDowell, D.L., "Extreme Value Fatigue of Advanced Alloys," ASME IMECE, Houston, TX, November 11-14, 2012.
286. Castelluccio, G.M. and McDowell, D.L., "Early Stage Fatigue Life Prediction for Metallic Polycrystals," ASME IMECE, Houston, TX, November 11-14, 2012.

287. Tiwari, S. and McDowell, D.L., "Atomistic Simulation Of Inelastic Dissipation Surfaces In Nanocrystalline Cu Under Multiaxial Loading," ASME IMECE, Houston, TX, November 11-14, 2012.
288. Xiong, L., Chen, Y., and McDowell, D.L., "Concurrent Atomistic-Continuum Simulatoin of Dislocation Pinning in Ni, Al and Si Crystals," ASME IMECE, Houston, TX, November 11-14, 2012.
289. Xiong, L., Chen, Y., and McDowell, D.L., "Coarse-Grained Atomistic Simulatoin of Dislocation Loops in Cu, Al and Si Crystals," ASME IMECE, Houston, TX, November 11-14, 2012.
290. Patra, A. and McDowell, D.L., "Crystal Plasticity Modeling of Localized Deformation in Irradiated BCC Metals," MRS Fall Meeting, Boston, November 26, 2012.
291. McDowell, D.L., "Extreme Events that Limit Lifetimes of Components: Microstructure-Sensitive High Cycle Fatigue," Joint CMU/Purdue/UMich/UES Workshop on DataFusion for the Detection of Rare and Anomalous Events, Dayton, OH, December 17-19, 2012.
292. McDowell, D.L., "Modeling Inelastic Behavior at Multiple Scales for Multiple Purposes," Plasticity 2013, Nassau, the Bahamas, January 3-8, 2013.
293. McDowell, D.L., "Microstructure-Sensitive Fatigue Simulation," Users Workshop for CCMD Technologies, CCMD Winter Meeting, Georgia Tech, February 20, 2013.
294. Tiwari, S. and McDowell, D.L., "A Defect Avalanche Approach To Characterize Inelastic Yield and Flow In Nanocrystalline Metals, Poster, TMS 2013 Annual Meeting and Exhibition, San Antonio, TX, March 3-7, 2013.
295. Priddy, M.W. and McDowell, D.L., "Crystal Plasticity Modeling of Slip and Twinning in Mg," Poster, TMS 2013 Annual Meeting and Exhibition, San Antonio, TX, March 3-7, 2013.
296. Patra, A. and McDowell, D.L., "Mesoscopic Modeling of Dislocation-Defect Interactions and Flow Localization in Irradiated bcc Metals," TMS 2013 Annual Meeting and Exhibition, San Antonio, TX, March 3-7, 2013.
297. Castelluccio, G.M. and McDowell, D.L., "Microstructure-Sensitive Mesoscopic Modeling of Fatigue Crack Formation and Early Growth in Polycrystals," TMS 2013 Annual Meeting and Exhibition, San Antonio, TX, March 3-7, 2013.
298. McDowell, D.L. "Damage Mechanics and Fatigue – A Discriminating Perspective," NAVAIR/DSTO Fatigue Technology Symposium, Melbourne, Australia, March 12-13, 2013.
299. McDowell, D.L. "Microstructure-Sensitive Modeling of Fatigue in Metals," NAVAIR/DSTO Fatigue Technology Symposium, Melbourne, Australia, March 12-13, 2013.
300. McDowell, D.L. "Modeling Microstructurally Small 3D Fatigue Crack Growth in Polycrystals," NAVAIR/DSTO Fatigue Technology Symposium, Melbourne, Australia, March 12-13, 2013.
301. Castelluccio, G.M. and McDowell, D.L., "Variability of the Fatigue Driving Force within Grains of Polycrystals," 13th International Conference on Fracture, June 16-21, 2013, Beijing, China.

302. Castelluccio, G.M. and McDowell, D.L., "Fatigue Life Prediction of Polycrystals under Multiaxial Straining," 13th International Conference on Fracture, June 16-21, 2013, Beijing, China.
303. Ellis, B., McDowell, D.L., and Zhou, M., "Design of Ultra-High Performance Fiber-Reinforced Concrete to Withstand Blast and Impact Loading," 50th Annual Technical Meeting of SES, Brown University, Providence, RI, July 31, 2013.
304. Tiwari, S. and McDowell, D.L., "Atomistic Simulation of the Inelastic Yield and Flow Behavior of Nanocrystalline Cu under Multiaxial Stress States," 50th Annual Technical Meeting of SES, Brown University, Providence, RI, July 31, 2013.
305. Li, Y., Zhou, M., and McDowell, D.L., and Zhou, M., "A Multiscale Materials Design Framework for Predicting Fracture Toughness as a Function of Microstructure," 50th Annual Technical Meeting of SES, Brown University, Providence, RI, July 31, 2013.
306. Austin, R.A. and McDowell, D.L., "A Model of High-Strain-Rate Metal Viscoplasticity with Application to Powder Shock Compression," 3rd International Conference on Material Modeling, Warsaw, Poland, September 8-11, 2013.
307. Tiwari, S. and McDowell, D.L., "Analyzing Multiaxial Inelastic Yield and Flow in Nanocrystalline Metals using Molecular Dynamics," 3rd International Conference on Material Modeling, Warsaw, Poland, September 8-11, 2013.
308. Luscher, D.J., Mayeur, J., McDowell, D.L., and Bronkhost, C., "Influence of Length Scale Parameters for Nonlocal Crystal Plasticity on Localization in Polycrystalline Specimens," International Conference on Material Modeling, Warsaw, Poland, September 8-11, 2013.
309. McDowell, D.L., "Redefining CAD to Incorporate Simulation-Assisted Integration of New and Improved Materials Development," Invited presentation at DARPA ISAT Rethinking CAD Workshop, October 24-25, 2013, Arlington, VA.
310. Narayanan, S., Zhu, T. and McDowell, D.L., "Crystal Plasticity Model for BCC Iron Atomistically Informed by the Kinetics of Correlated Kinkpair Nucleation," MS&T '13, Montreal, Quebec, Canada, October 27-31, 2013.
311. Patra, A., Zhu, T., and McDowell, D.L., "Constitutive Equations for Dislocation Core Spreading in BCC-Fe Accounting for Dislocation-Dislocation Interactions and Finite Temperature Effects," MS&T '13, Montreal, Quebec, Canada, October 27-31, 2013.
312. McDowell, D.L., "Modeling Inelastic Behavior of Metals at Multiple Scales to Support Materials Design," MS&T '13, Montreal, Quebec, Canada, October 27-31, 2013.
313. Cochran, J., Daloz, W., Marshall, P., McDowell, D.L., Patra, A., Wedding, C., and Strbik, O., "Silicon and Boron Containing Composites of Molybdenum Alloyed with Manganese," MS&T '13, Montreal, Quebec, Canada, October 27-31, 2013.
314. Xiong, L., McDowell, D.L., and Chen, Y., "Multiscale Simulations of Phonon-dislocation Interactions," ASME IMECE, San Diego, CA, Nov. 18-21, 2013.
315. Castelluccio, G.M. and McDowell, D.L., "Mesoscopic Modeling Fatigue Crack Formation and Early Growth in 3D Polycrystalline Microstructures," ASME IMECE, San Diego, CA, Nov. 18-21, 2013.

316. Li, Y., Zhou, M., and McDowell, D.L., "A multi-scale material design space for tailoring fracture toughness of polycrystalline metals," ASME IMECE, San Diego, CA, Nov. 18-21, 2013.
317. McDowell, D.L., "Extreme Value Fatigue Assessment of Microstructures," Symposium JJ: Materials Fundamentals of Fatigue and Fracture, MRS Fall Meeting, Boston, MA, Dec. 3, 2013.
318. Tiwari, S., Tucker, G.J., and McDowell, D.L., "Pressure Effects and Tension-Compression Asymmetry in Response of Nanocrystalline Metals," Plasticity 2014, Freeport, the Bahamas, January 3-8, 2014.
319. Lloyd, J.T., Clayton, J.D., and McDowell, D.L., "Modeling the Single and Polycrystalline Shock Response of Aluminum," Plasticity 2014, Freeport, the Bahamas, January 3-8, 2014.

V. SERVICE

A. Professional Contributions

1. Member, American Society of Mechanical Engineers (ASME).
2. Member American Society of Testing and Materials (ASTM).
3. Member, American Academy of Mechanics (AAM).
4. Member, American Society for Engineering Education (ASEE).
5. Appointed as Member of U.S. National Committee on Theoretical and Applied Mechanics, administered by the National Research Council (ASTM representative), 1994-2000.
6. Member, Materials Research Society (MRS).
7. Member, ASM-International.
8. Member, Society of Engineering Science (SES). Elected to Board of Directors of the Society of Engineering Science, 2000; elected Vice President of SES in October 2000 for the year 2001; President of SES, calendar year 2002.
9. Member, TMS.

Major Conference Organization

1. Vice-Chairman, 22nd National Symposium on Fracture Mechanics, ASTM, Atlanta, GA, June 26-28, 1990.
2. PI/PD and Co-Organizer (with Prof. T.L. Story of Morehouse College) of an NSF-sponsored workshop "New Directions in Materials Design Science and Engineering," held Oct. 19-21, 1998 in Atlanta, GA.
3. Co-organizer with Professor Ewald Werner of TU-Munich and Reinhold Kienzler of Bremen University, "Mechanics of Materials," Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, May 5-11, 2002.
4. Co-Organizer with K.Z. Hwang, Tsinghua University, and J. Fan, Chongqing University, International Conference on Heterogeneous Material Mechanics held in Chongqing, China, June 21-26, 2004.

5. Co-Chairman with Professor Chakraborty Madhusudan, IIT Kharagpur (Secretary: Sudipto Ghosh, IIT Kharagpur, India; Joint Secretary, Farrokh Mistree, Georgia Tech.), International Conference on Advanced Materials Design and Development (ICAMDD-2005), Goa, India, Dec. 14-16, 2005.
6. Co-organizer with Professor Ewald Werner of TU-Munich and Reinhold Kienzler of Bremen University of “Mechanics of Materials,” a one-week symposium sponsored by Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, Jan. 22-28, 2006.
7. Co-organizer with Professors W.S. Johnson of Georgia Tech, A. Saxena of the University of Arkansas, and J. Newman of Mississippi State University, *Fatigue 2006*, International Congress on Fatigue (held once every four years), hosted by Georgia Tech, Atlanta, GA, May 14-19, 2006.
8. Co-Chair with K.C. Hwang, Tsinghua University, X.P. Wu, University of Science and Technology of China, and J. Fan, Alfred University and Chongqing University, International Conference on Heterogeneous Material Mechanics (ICHMM 2008) held in Huangshan, China, June 3-8, 2008.
9. Co-Chair with Y.L. Bai, Chinese Academy of Sciences, Z. Wang, Shanghai University, and J. Fan, Alfred University and Chongqing University, 3rd International Conference on Heterogeneous Material Mechanics (ICHMM 2011) held at Chongming Island, Shanghai, China, May 22-26, 2011.
10. Co-organizer with E. Werner, R. Kienzler and S. Mueller, Workshop on Mechanics of Materials, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, March 19-23, 2012.
11. Chair, 49th Annual Technical Meeting of the Society of Engineering Science (SES), Georgia Tech Hotel, Oct. 10-12, 2012 (420 participants).
12. Member of the Scientific Committee, 3rd International Conference on Material Modeling (incorporating 13th European Mechanics of Materials Conference, Warsaw, Poland, Sept. 8-11, 2013
13. Co-organizer, with E. Busso, A.A. Benzerga and T. Pardoen, Symposium JJ: Materials Fundamentals of Fatigue and Fracture in honor of Acta Materialia Gold Medalist Andre Pineau, MRS Fall Meeting, Boston, MA, Dec. 3, 2013.

Membership on Editorial Boards:

1. Editorial Advisory Board, International Journal of Plasticity, 1991-present.
2. Editor, 1997-2002, ASME Journal of Engineering Materials and Technology.
3. Editorial Advisory Board, International Journal of Damage Mechanics, 1993-present.
4. Regional Editor, International Journal of Fracture, 1997-2005.
5. Editorial Board, Journal of Multiscale Computational Engineering, 2002-present.
6. Editorial Board, Mechanics of Advanced Materials and Structures, 2004-present.
7. Co-Editor, International Journal of Fatigue, 2007-present.
8. Editorial Board, Journal of Multiscale Modeling, 2013-present.

B. Major Georgia Tech Leadership Contributions

1. Elected to the Faculty Senate, 1992-1994.
2. Elected to the Executive Board of the Institute, 1992-94.
3. Associate Director (1983-1992) and Director (1992-2012) of the Georgia Tech Mechanical Properties Research Laboratory (MPRL), an interdisciplinary center administered by OIP until 1996 and CoE thereafter. With annual research expenditures of approximately \$3M, the MPRL is among the nation's leading university laboratories in high temperature fatigue and fracture research (CoE).
4. Chair, Georgia Tech Materials Council, 1994-2012.
5. Co-Chair, College of Engineering Dean's Search Committee, 2001-02 (CoE).
6. Chair, Promotion and Tenure ADVANCE Committee, 2002-2003, Charged by Provost J.-L. Chameau as part of NSF ADVANCE program at Georgia Tech.
7. Chair, Organizing Committee for Fall 2004 Faculty Research Retreat, Mechanical Engineering.
8. Chair, Governance and Commitment to Rules Compliance Subcommittee, Georgia Tech NCAA Athletics Certification Process, 2006-07 (appointed by President W. Clough)
9. Chair, Search Committee for Woodruff Chair in Mechanical Systems, 2008-09 (ME).
10. Chair, Woodruff School of Mechanical Engineering Strategic Planning Committee, 2009-2010.
11. Member, Strategic Plan Implementation Steering Committee (Institute), 2011-2012.
12. Chair, Search Committee for Dean of College of Sciences at Georgia Tech, 2012-2013.
13. Member, MSE Committee for Strategic Planning, 2012-2013.
14. Chair of Materials Research Institute Task Force and Appointed as Founding Director of the new Institute for Materials (IMat), 2012; named Executive Director in July 2013. Report to the Executive Vice President for Research.

VI. HONORS AND AWARDS

- Metro Atlanta Area Young Engineer-of-the-Year Award, 1986
- Alfred Noble Prize, awarded jointly by ASCE, ASME, IEEE, AIMMPE, and WSE, 1986 for best paper by author under 31 years of age
- NSF Presidential Young Investigator Award, 1986
- Pi Tau Sigma Gold Medal, 1987, awarded for outstanding contributions in Mechanical Engineering by an individual less than 10 years beyond the B.S. degree.
- ASME Henry Hess Award, 1988, for outstanding technical paper by an author under 31 years of age
- SAE Ralph R. Teetor Award, 1986
- ASEE Dow Outstanding Young Faculty Award, 1990

- Selected as one of 15 members (fields of math, physics, chemistry, engineering) of the Defense Science Study Group.
- Woodruff Faculty Fellow in Mechanical Engineering at Georgia Tech for the term July 1991-June 1996.
- Georgia Tech Faculty Research Author Award, 1993, in recognition of outstanding publication of results obtained from research conducted at Georgia Tech from January 1, 1988 to December 31, 1992.
- Named an Institute Fellow at Georgia Tech, 1994-1999.
- Medaile de'honneur, Societe Francaise de Metallurgie et de Materiaux (SF2M), 1994
- Named a Fellow of ASME, 1995
- Named Regents' Professor, Georgia Tech, 1996-present
- 1997 ASME Nadai Award recipient, Materials Division.
- 1998 Invited lecturer for Midwest Mechanics Lecture Series.
- Named Carter N. Paden, Jr. Distinguished Chair in Metals Processing at Georgia Tech, September 1998.
- Georgia Tech Outstanding Doctoral Thesis Advisor Award, 2000, in recognition of the achievements of a faculty member's doctoral students who completed all degree requirements from January 1, 1995 to December 31, 1999.
- American Foundrymen's Society Team Award, USAMP-AMD-DPO Project, 1995-2000.
- President of Society of Engineering Science (SES), 2002.
- Georgia Tech Outstanding Interdisciplinary Activities Award, 2001, in recognition of his pioneering work in developing interdisciplinary collaborations and programs that have enhanced research and teaching at Georgia Tech.
- ASTM Committee E.08 Award of Appreciation for outstanding service as the ASTM Representative on the U.S. National Committee on Theoretical and Applied Mechanics, 1994-2001, November 2001.
- ASTM Annual Fatigue Lecturer, Miami Beach, FL, Nov. 5, 2002.
- Jack M. Zeigler Woodruff School Outstanding Educator Award, 2004.
- ASME Materials Division Senior Orr Award (Orr Best Paper Award) for the best fatigue and fracture paper to appear within the twelve-month period July 2005 through June 2006 in the ASME Journal of Engineering Materials and Technology (joint with R.W. Neu).
- Elected Fellow of the Society of Engineering Science (SES), 2007.
- 2008 Khan International Medal for career contributions to the field of plasticity.
- Elected Fellow of ASM International, 2008.
- Distinguished Alumni Award, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, April 24, 2009.
- Inter-University Mechanics Lecture Tour (Madrid, Granada, Seville, Zaragoza universities in Spain), November 3-11, 2010.
- Elected Fellow of the American Academy of Mechanics, 2011.

Awards Received by Students

- Samuel Graham, Jr. - Recipient of the Outstanding Young Investigator Award in 1997 from the International Thermal Conductivity Conference and co-winner of the 1998-99 Luther S. Long III Memorial Award in Engineering Mechanics from Georgia Tech
- Ryan Morrissey - Recipient of outstanding student presentation of research paper award from the American Society of Testing and Materials (ASTM), Orlando, FL, November 2000.
- Carolyn Conner Seepersad – Recipient of GT Sigma Xi Best PhD Thesis Award, 2005 (co-advised with F. Mistree and J.K. Allen). Also recipient of 2010 Regents' Outstanding Teaching Award in the University of Texas System as Assistant Professor at UT-Austin.
- Mahesh Shenoy – Best Poster Award, International Conference on Advanced Materials Design and Development, December 14-16, 2005, Goa, India.
- John Clayton, NSF Fellow, 1999-2002.
- Mark Tschopp, NSF Fellow, 2004-2007 and winner of the 2006-07 Luther S. Long III Memorial Award in Engineering Mechanics from Georgia Tech
- Ryan Austin, National Defense Science and Engineering Graduate (NDSEG) Fellowship, DoD, 2006-2009.
- Mark Tschopp – Recipient of the GT Sigma Xi Best PhD Thesis Award, 2008
- Craig Przybyla – Recipient of ASEE Science, Mathematics, And Research for Transformation Program (SMART Program) Fellowship, April 2008, sponsored by Air Force Research Lab - Materials & Manufacturing located in Wright-Patterson Air Force Base, OH
- Ryan Austin, SAIC Georgia Tech Student Paper Competition Award, November 2009.
- Jeffrey Lloyd, Recipient of ASEE Science, Mathematics, And Research for Transformation Program (SMART Program) Fellowship, June 2011, sponsored by Army Research Laboratory in Aberdeen, MD.
- Jeffrey Lloyd, recipient of the US Army Research Laboratory (ARL) Director's Award for best graduate student presentation “Steady Plastic Waves in Metals” by winning all three of the competitions at the division, directorate, and ARL-wide levels, August 2012.