

William J. Boettinger

Publications

1. "Direct Observation of Eutectic Solidification Using Surface Relief Contrast," W. J. Boettinger and R. B. Pond, Sr., *Met. Trans.* 4, 1987-1988 (1973).
2. "The Structure of Directional Solidified Two-Phase Sn-Cd Peritectic Alloys," W. J. Boettinger, *Met. Trans.* 5, 2023-2031 (1974).
3. "X-Ray Topographic Observations of Dislocation Arrangements in Large Czochralski-Grown Copper Crystals and Their Behavior at High Temperature," M. Kuriyama, W. J. Boettinger, J. G. Early and H. E. Burdette, *Acta Cryst.* A31, S259 (1975).
4. "On the Angular Divergence of Out-Going Beams in an Asymmetric Diffraction Geometry," M. Kuriyama and W. J. Boettinger, *Acta Cryst.* A32, 511 (1976).
5. "Application of Contrast Conditions to Dynamical Images of Immobile Dislocations," W. J. Boettinger, H. E. Burdette and M. Kuriyama, *Phil. Mag.* 34, 119-127 (1976).
6. "Asymmetric Crystal Topographic Camera," W. J. Boettinger, H. E. Burdette, M. Kuriyama and R. E. Green, Jr., *Rev. Sci. Inst.* 47, 906-911 (1976).
7. "X-Ray Topographic Observation of Magnetic Domains in Czochralski-Grown Nickel Single Crystals in Anomalous Transmission Geometry," M. Kuriyama, W. J. Boettinger and H. E. Burdette, *J. Appl. Phys.* 47, 5064-5068 (1976).
8. "X-Ray Surface Reflection and Transmission Topography of Magnetic Domain Walls in Czochralski-Grown Nickel Single Crystals," M. Kuriyama, W. J. Boettinger and H. E. Burdette, *J. Mats. Sci.* 12, 353-357 (1977).
9. "Some Topographic Observations of the Effects of Dynamical Diffraction in Imperfect Metal Crystals," W. J. Boettinger, H. E. Burdette, E. N. Farabaugh and M. Kuriyama, *Advances in X-Ray Analysis*, Vol. 20, 207-219 (1977).
10. "Crystal Imperfections and Magnetic Domain Walls in Thick Czochralski-Grown Nickel Single Crystals," M. Kuriyama, W. J. Boettinger and H. E. Burdette, *Advances in X-Ray Analysis*, Vol. 20, 245-257 (1977).
11. "Observation of Oblique Magnetic Domain Walls in Nickel Single Crystals by X-Ray Topography," W. J. Boettinger, M. Kuriyama and H. E. Burdette, *Phil. Mag.* 36, 763-776 (1977).
12. "Crystal Imperfections in Czochralski Nickel Single Crystals," M. Kuriyama, W. J. Boettinger and H. E. Burdette, *J. Crystal Growth* 43, 287-300 (1978).

13. "X-Ray Magnifier," W. J. Boettinger, H. E. Burdette and M. Kuriyama, *Rev. Sci. Inst.* 50, 26-30 (1979).
14. "Convective and Interfacial Instabilities during Unidirectional Solidification of a Binary Alloy," S. R. Coriell, M. R. Cordes, W. J. Boettinger and R. F. Sekerka, *J. Cryst. Growth* 49, 13-28 (1980).
15. "Energy Dispersive XRF Composition Profiling Using Crystal Collimated Incident Radiation," W. J. Boettinger, H. E. Burdette and M. Kuriyama, *Advances in X-Ray Analysis*, Vol. 23, 209-217 (1980).
16. "X-Ray Residual Stress Evaluation by an Energy Dispersive System," M. Kuriyama, W. J. Boettinger and H. E. Burdette, *Proceedings of Symposium on Accuracy in Powder Diffraction*, NBS Spec. Pub. 567 (1979).
17. "Basic Limits in Real Time Industrial Imaging Systems," M. Kuriyama, W. J. Boettinger and H. E. Burdette, *Real Time Radiographic Imaging: Medical and Industrial Applications*, D. A. Garrett and D. A. Blocker, eds., ASTM STP716, 113-127 (1980).
18. "Rapid Solidification," J. W. Cahn, S. R. Coriell and W. J. Boettinger, *Laser and Electron Beam Processing of Materials*, C. W. White and P. S. Peercy, eds., Academic Press, p. 89. (*Proc Mats. Res. Soc.*, November 1979).
19. "Eutectic Solidification and the Formation of Metallic Glasses," W. J. Boettinger, F. S. Biancaniello, G. M. Kalonji and J. W. Cahn, *Rapid Solidification Processing: Principles and Technologies*, Vol. 2, Claitor's, Baton Rouge, R. Mehrabian, B. H. Kear and M. Cohen, eds. (1980), p. 50.
20. "Crystal Subgrain Misorientations Observed by X-Ray Topography in Reflection," R. W. Armstrong, W. J. Boettinger and M. Kuriyama, *J. Appl. Cryst.* 13, 417-424 (1980).
21. "Solutal Convection Induced Macrosegregation and the Dendrite to Composite Transition in Off-Eutectic Alloys," W. J. Boettinger, F. S. Biancaniello and S. R. Coriell, *Met. Trans. A* 12A, 321-327 (1981).
22. "Effect of Gravity on Coupled Convective and Interfacial Instabilities during Directional Solidification," S. R. Coriell, M. R. Cordes, W. J. Boettinger and R. F. Sekerka, *Adv. Space Res.* 1, 5-11 (1981).
23. "Relationship between Process Variables, Microstructure and NDE of a Precipitation-Hardened Aluminum Alloy," L. J. Swartzendruber, W. J. Boettinger, L. K. Ives, S. R. Coriell and R. Mehrabian, *Nondestructive Evaluation: Microstructure Characterization and Reliability Prediction*, S. Wolf and O. Buck, eds., TMS-AIME

(1981) Warrendale, PA, pp. 253-271.

24. "The Effect of Alloy Constitution and Crystallization Kinetics on the Formation of Metallic Glass," W. J. Boettinger, Rapidly Quenched Metals IV, T. Masumoto and K. Suzuki, eds., The Japan Inst. of Metals, 99 (1982).
25. "Real Time Topography with X-Ray Image Magnification," W. J. Boettinger, R. C. Dobbryn, H. E. Burdette, M. Kuriyama, Nucl. Inst. and Meth. 195, 355-361 (1982).
26. "Controlled Rapid Solidification by Electron Beam Surface Melting," R. J. Schaefer, W. J. Boettinger, F. S. Biancaniello and S. R. Coriell, Lasers in Metallurgy, K. Mukherjee and J. Mayumder, eds., TMS-AIME, pp. 43-52 (1981).
27. "Synchrotron Radiation Topography," M. Kuriyama, W. J. Boettinger and G. G. Cohen, Ann. Rev. Mats. Sci. 12, 23-50 (1982).
28. "X-Ray Residual Stress Mapping in Industrial Materials by Energy Dispersive Diffractometry," C. J. Bechtoldt, R. C. Placios, W. J. Boettinger and M. Kuriyama, Adv. X-Ray Anal., 25, 329-388 (1982).
29. "Growth Kinetic Limitations in Rapid Solidification," W. J. Boettinger in Rapidly Solidified Crystalline and Amorphous Alloys, B. H. Kear and B. C. Giessen, eds., Elsevier North Holland, NY, pp. 15-31 (1982).
30. "Conference on Rapidly Quenched Metals," W. J. Boettinger, J. Metals 33, 21 (1981).
31. "Use of Metastable Phase Diagrams in Rapid Solidification," J. H. Perepezko and W. J. Boettinger, in Alloy Phase Diagrams, L. H. Bennett, T. B. Massalski and B. C. Giessen, eds., Mat. Res. Soc. Symp. Proc. 19, Elsevier North Holland, NY, pp. 223-240 (1983).
32. "Mechanisms of Segregation-Free Solidification," W. J. Boettinger, S. R. Coriell and R. F. Sekerka, Mat. Sci. and Eng. 65, 27-36 (1984).
33. "The Effect of Solidification Velocity on the Microstructure of Ag-Cu Alloys," W. J. Boettinger, D. Shechtman, R. J. Schaefer, and F. S. Biancaniello, Met. Trans. 15A, 55-66 (1984).
34. "The Microstructure of Rapidly Solidified NiAl-Cr Quasibinary Eutectic," D. Shechtman, W. J. Boettinger, T. Z. Kattamis and F. S. Biancaniello, Acta Met. 32, 749-756 (1984).
35. "NBS Materials Science Beam Line at NSLS," R. Spal, R. C. Dobbryn, H. E. Burdette, G. G. Long, W. J. Boettinger and M. Kuriyama, Nucl. Inst. and Meth., 222, 189-192 (1984).

36. "White Beam Synchrotron Topography of Metals and Alloys," W. J. Boettinger, H. E. Burdette and M. Kuriyama, in Applications of X-Ray Topographic Methods to Materials Science, S. Weissmann, F. Balibar and J. Petroff, eds., Plenum, NY, pp. 283-293 (1984).
37. "Asymmetric Crystal Topography with X-Ray Image Magnification," M. Kuriyama and W. J. Boettinger, in Applications of X-Ray Topographic Methods to Materials Science, S. Weissmann, F. Balibar and J. Petroff, eds., Plenum, NY, 23-32 (1984).
38. "Cellular Microsegregation in Rapidly Solidified Ag-15 wt% Cu Alloys," L. A. Bendersky and W. J. Boettinger, in Rapidly Quenched Metals, S. Steeb and H. Warlimont, eds, Elsevier Science Publishers, B.V., 887-890 (1985).
39. "The Effect of Rapid Solidification Velocity on Microstructure and Phase Solubility Extension in NiAl-Cr Quasibinary Eutectic," W. J. Boettinger, D. Shechtman, T. Z. Kattamis and R. J. Schaefer, in Rapidly Quenched Metals, S. Steeb, H. Warlimont, eds., Elsevier Science Publishers, B.V., 871-874 (1985).
40. "Icosahedral Al-Mn and Related Phases: Resemblance in Structure," L. Bendersky, R. J. Schaefer, F. S. Biancaniello, W. J. Boettinger, M. J. Kaufman and D. Shechtman, *Scripta Met.* 19 (1985) 909.
41. "Microstructural Variations in Melt Spun Ribbons," L. A. Bendersky and W. J. Boettinger, Proceedings of 43rd Annual Meeting of the Electron Microscope Society of America, G. W. Bailey, ed., San Francisco Press, San Francisco, CA (1985) 54-55.
42. "The Structure of Solid Solutions," W. J. Boettinger, in Metals Handbook, 9th ed., Vol. 9, ASM (1985) p. 611-617.
43. "Fundamentals of Rapid Solidification," W. J. Boettinger and J. H. Perepezko, in "Rapidly Solidified Crystalline Alloys," S. K. Das, B. H. Kear, C. M. Adam, eds., TMS-AIME, 1985, 21-60.
44. "An Analysis of the Microstructure of Al-8 wt% Fe Rapidly Solidified Powders," W. J. Boettinger, L. A. Bendersky, J. G. Early, *Met. Trans. A*, 17A (1986) 781-790.
45. "Microstructure Formation in Rapidly Solidified Alloys," W. J. Boettinger and S. R. Coriell, in Science and Technology of the Undercooled Melt, P. R. Sahm, H. Jones and C. M. Adam, eds., NATO ASI Series E-N0114, Martinus-Nijhof, Dodrecht, 1986, p. 81.
46. "Icosahedral and Decagonal Phase Formation in Al-Mn Alloys," R. J. Schaefer, L. A. Bendersky, D. Shechtman, W. J. Boettinger and F. S. Biancaniello, *Met. Trans.* 17A, (1986) 2117-2125.

47. "Kinetics of Resolidification," J. H. Perepezko and W. J. Boettinger, in Surface Alloying by Ion Electron and Laser Beams, L. E. Rehm, S. T. Picraux, K. H. Wiedersich, eds., ASM, Metals Park, OH (1987)
48. "Microstructural Characterization of Rapidly Solidified Nb-Si Alloys," L. A. Bendersky, F. S. Biancaniello, W. J. Boettinger and J. H. Perepezko, J. Mat. Sci. and Eng., 89, 151 (1987).
49. "Microsegregation in Rapidly Solidified Ag-15 wt% Cu," W. J. Boettinger, L. A. Bendersky, S. R. Coriell, R. J. Schaefer and F. S. Biancaniello, J. Cryst. Growth, 80 (1987) 17.
50. "A Study of the Coarsening of Liquid-Solid Mixtures Using Synchrotron Radiation Microradiography," W. J. Boettinger, P. W. Voorhees, R. C. Dobbryn and H. E. Burdette, Met. Trans. 18A (1987) 487-490.
51. "Application of Dendritic Growth Theory to the Interpretation of Rapid Solidification Microstructures," W. J. Boettinger, S. R. Coriell and R. K. Trivedi, in Rapid Solidification Processing: Principles and Technologies IV, R. Mehrabian and P. A. Parrish, ed., Claitor's Publishing Division, Baton Rouge, LA, 13-25 (1988).
52. "On the Formation of Dispersoids during Rapid Solidification of an Al-Fe-Ni Alloy," W. J. Boettinger, L. A. Bendersky, R. J. Schaefer and F. S. Biancaniello, Met. Trans. 19A (1988) 1101-1107.
53. "Rapid Solidification and Ordering of L21 and B2 Phases in the NiAl-NiTi Systems," W. J. Boettinger, L. A. Bendersky, F. S. Biancaniello and J. W. Cahn, Mat. Sci. and Eng., 98, 273-276 (1988).
54. "Microstructural Variations in Rapidly Solidified Alloys," W. J. Boettinger, Mat. Sci. and Eng., 98 123-130 (1988).
55. "Pathways for Microstructural Development in TiAl," L. A. Bendersky, J. A. Graves, F. S. Biancaniello, J. H. Perepezko and W. J. Boettinger, Mat. Sci. and Eng., 98, 265-268 (1988).
56. "Solidification of an Amorphous Phase in Rapidly Solidified Al-Fe-Si Alloys," L. A. Bendersky, M. J. Kaufman, W. J. Boettinger and F. S. Biancaniello, Mat. Sci. and Eng., 98, 213-216 (1988).
57. "The Role of Elastic Energy in the Morphological Development of a Ni-Ti-Al Alloy," L. A. Bendersky, P. W. Voorhees, W. J. Boettinger and W. C. Johnson, Scripta Met., 22, 1029-1034 (1988).
58. "Investigation of B2 and Related Phases in the Ti-Al-Nb Ternary System," L. A. Bendersky & W. J. Boettinger, Mat. Res. Soc. Sys. Proc., Mat. Res. Soc. Symp.

59. "A Theory for the Trapping of Solute & Disorder in Intermetallic Compounds by Rapid Solidification," W.J. Boettinger and M.J. Aziz, *Acta. Metall.* 37, 3379-3392, (1989).
60. "Omega-related Phases in a Ti-Al-Nb Alloy," L. A. Bendersky & W. J. Boettinger, *Proceedings of the 47th Annual Mtg of the Electron Microscope Society of America*, G. W. Bailey, ed., San Francisco Press, San Francisco, CA (1989) 324-325.
61. "The Microstructure of Rapidly Solidified Alloys," W. J. Boettinger, in *Metastable Microstructures: Principles, Design and Applications*, D. Banerjee and L. A. Jacobsen, eds., (Proceedings of US-Indo Workshop on Metastable Materials in Goa India, March 30 - April 1, 1989), Oxford and IBH Publishing, New Delhi, p.49-66.
62. "The Formation of Ordered ω -Related Phases in Alloys of Composition Ti₄Al₃Nb," L. A. Bendersky, W. J. Boettinger, B. P. Burton, F. S. Biancaniello and C. B. Shoemaker, *Acta Met.* 38 (1990), 931-943.
63. "Fundamentals of Solidification at High Rates," W. J. Boettinger and J. H. Perepezko, in *Rapidly Solidified Alloys - Processes, Structure, Properties and Applications*, H. Lieberman, ed., Marcel-Decker, N. Y., (1993), p.17-78.
64. "Coherent Precipitates in the BCC/Orthorhombic Two Phase Field of the Ti-Al-Nb System," L. A. Bendersky, W. J. Boettinger and A. Roytburd, *Acta Met.* 39 (1991), 1959-1969
65. "Ordered Omega Derivatives in a Ti-37.5Al-20Nb at% Alloy", L. A. Bendersky, B. P. Burton, W. J. Boettinger, and F. S. Biancaniello, *Scripta Met.* 24 (1990) 1541-1546.
66. "Thermodynamic Constraints on Non-Equilibrium Solidification of Ordered Intermetallic Compounds", W. J. Boettinger, *Mat. Sci and Eng.* A133 (1991), 438-442.
67. "Disorder Trapping in Ni₂TiAl", W. J. Boettinger, L. A. Bendersky, J. A. West, M. J. Aziz, and J. Cline, *Mat. Sci and Eng.*, A133 (1991), 592-595.
68. "Neutron Powder Diffraction Study of the Orthorhombic Ti₂AlNb Phase", B. Mozer, L. A. Bendersky, W. J. Boettinger, and R. G. Rowe, *Scripta Met.* 24 (1990), 2363-2368.
69. "Crystallography and Thermodynamics of Hierarchical Structures of (Ti,Nb)₃Al Alloys", L. A. Bendersky, W. J. Boettinger, and A. Roytburd, in *Proceedings of International Symposium on Intermetallic Compounds - Structure and Properties - (JIMIS-6)*, ed. by O. Izumi, The Japan Institute of Metals, Sendai, Japan, 1991, pp.

845-849.

70. "The Al-Cu-Fe Phase Diagram - Equilibria Involving The Icosahedral Phase", F. W. Gayle, A. J. Shapiro, F. S. Biancianiello, and W. J. Boettinger, *Met. Trans.* 23A, (1992) 2409-2417.
71. "Controlled Interface Roughness in GaAs/AlAs Superlattices", W. R. Miller, W. J. Boettinger, W. F. Tseng, J. Pellegrino and J. Comas, *Mat. Res. Soc. Proc.*, 230 (1992) 213.
72. "Investigation of the Phase Constitution of Al₂TiTa", W. J. Boettinger, A. J. Shapiro, J. P. Cline, F. W. Gayle, L. A. Bendersky and F. S. Biancianiello, *Scripta Met. Mat.* 25, 1991, 1993-1998.
73. "On the Wetting of the Intermetallics Cu₆Sn₅ and Cu₃Sn by Pb-Sn Alloys, W. J. Boettinger, Carol A. Handwerker, and L. C. Smith, in *The Metal Science of Joining*, M. J. Cieslak, J. H. Perpezko, S. Kang and M. E. Glicksman, eds., TMS-AIME, (1992), Warrendale, PA, p.183-190.
74. "Towards a Phase Field Model for Phase Transitions in Binary Alloys", A. A. Wheeler, W. J. Boettinger, in *On the Evolution of Phase Boundaries*, edited by M.E. Gurtin and G.B. McFadden, IMA Volumes in Mathematics and its Applications, Vol. 43, 1992, Springer-Verlag, p. 127-136.
75. "A Phase Field Model for Isothermal Phase Transitions in Binary Alloys", A. A. Wheeler, W. J. Boettinger and G. B. McFadden, *Phys. Rev A* 45 (1992) 7424-7239.
76. "Thermodynamic Calculation of the Ternary Ti-Al-Nb System", U. R. Kattner and W. J. Boettinger, *Mat. Sci. & Eng.*A152 (1992), 9-17.
77. "Application of Ternary Phase Diagrams to the Development of MoSi₂-based Materials", W. J. Boettinger, J. H. Perepezko, and P. S. Frankwicz, *Mat. Sci. & Eng.* A155 (1992) 33-44.
78. "Intermetallic Ti-Al-Nb Alloys based on Strengthening of the Orthorhombic Phase by w-type Phases", L.A. Bendersky, W.J. Boettinger, and F. S. Biancianiello, *Mat. Sci. and Eng.* A152 (1992), 41- 47.
79. "Transformation of BCC and B2 High Temperature Phases to HCP and Orthorhombic Structures in the Ti-Al-Nb System. Part I: Microstructural Predictions Based on a Subgroup Relation between Phases", L.A.Bendersky, A.Roytburd and W.J.Boettinger, *J. Res. NIST* (98) 1993, 561.
80. "Transformation of BCC and B2 High Temperature Phases to HCP and Orthorhombic Structures in the Ti-Al-Nb System. Part II: Experimental TEM Study of Microstructures", L.A.Bendersky, W.J.Boettinger and A.Roytburd, *J. Res. NIST* 98

(1993) 585.

81. "Calculation of Alloy Solidification Morphology", W. J. Boettinger, A. A. Wheeler, G. B. McFadden, and R. Kobayashi, in Modeling of Casting, Welding and Advanced Solidification Processes - V, T. S. Piwonka, V. Voller, and L. Katgerman eds., TMS, (1993), Warrendale, PA, 79-86.
82. "A Phase Field Model of Solute Trapping during Solidification", A. A. Wheeler, W. J. Boettinger, and G. B. McFadden, Phys. Rev. E, 47 (1993) 1893-1909.
83. "Reactive Wetting and Intermetallic Formation", W. J. Boettinger, C. A. Handwerker, and U. R. Kattner, in The Mechanics of Solder Alloy Wetting and Spreading, D. Frear, F. M. Hosking, F. Yost, eds., Van Nostrand Reinhold, New York, 1993, p. 103.
84. Oxidation of Cu-Sn and Ni-Sn Intermetallic Compounds", U. Bertocci, C. A. Handwerker, S. M. Hues, and W. J. Boettinger, in Proceedings of the Second International Symposium on the Corrosion and Reliability of Electronic Materials and Devices, R. B. Comizzoli and J. D. Sinclair, eds., The Electrochemical Society, (1993), Pennington, NJ, p. 99-118.
85. "A Phase-Field, Diffuse Interface Solidification Model for Pure Metals and Binary Alloys", W. J. Boettinger, A. A. Wheeler, B. T. Murray, G. B. McFadden, and R. Kobayashi, in Modeling of Coarsening and Grain Growth, S. P. Marsh and C. S. Pande, eds., The Minerals, Metals and Materials Society, Warrendale, PA, 1993, 45.
86. "Computation of Dendritic Solidification using a Phase-Field Model", B. T. Murray, W. J. Boettinger, G. B. McFadden and A. A. Wheeler, in Heat Transfer in Melting, Solidification, and Crystal Growth, 1993, Iz S. Habib and S. Thynell, eds., The American Society of Mechanical Engineers, New York, 1993, 67.
87. "On the Transition from Short-Range Diffusion-Limited to Collision-Limited Growth in alloy Solidification", M. J. Aziz and W. J. Boettinger, Acta Metall. Mater., 42 (1994) 527.
88. "Prediction of Solute Trapping at High Solidification Rates Using a Phase-Field Diffuse Interface Theory of Alloy Solidification, W. J. Boettinger, A. A. Wheeler, B. T. Murray and G. B. McFadden, Mat. Sci. & Eng. A178 (1994) 217.
89. "On the Sn-Bi-Ag Ternary Phase Diagram", U. R. Kattner and W. J. Boettinger, J. Electronic Materials 23 (1994) 603.
90. "Phase Transformation in the (Ti, Nb)₃Al Section of the Ti-Al-Nb System. Part I: Microstructural predictions based on a subgroup relation between phases", L. A. Bendersky, A. Roytburd and W. J. Boettinger, Acta Metall. Mater., 42 (1994) 2323.
91. "Phase Transformations in the (Ti,Nb)₃Al Section of the Ti-Al-Nb System. Part II:

- Experimental TEM study of microstructures", L. A. Bendersky and W. J. Boettinger, *Acta Metall. Mater.* 42, (1994) 2337.
92. "Prediction of Dendritic Growth and Microsegregation Patterns in a Binary Alloy Using the Phase-Field Method", J. A. Warren and W. J. Boettinger, *Acta Metall. et Mater.*, 43, (1995) 689.
 93. "Recent Developments in Phase-Field Models of Solidification", A. A. Wheeler, N. A. Ahmad, W. J. Boettinger, R. J. Braun, G. B. McFadden, and B. T. Murray, *Adv. Space Res.* 16, (1995), (7)163.
 94. "Phase-Field Model for Solidification of a Eutectic Alloy", A. A. Wheeler, G. B. McFadden and W. J. Boettinger, *Proc. Royal Soc., Series A*, 452 (1996), 495-525.
 95. "Lubrication Theory for Reactive Spreading of a Thin Drop", R. J. Braun, B. T. Murray, W. J. Boettinger and G. B. McFadden, *Phys.Fluids* 7 (1995) 1797.
 96. "The Phase Field Method: Simulation of Alloy Dendritic Solidification during Recalescence", W. J. Boettinger and J. A. Warren, *Met. Trans.*27A, (1996), p. 657-669.
 97. "Development of Multicomponent Solidification Micromodels Using A Thermodynamic Phase Diagram Data Base" W. J. Boettinger, U. R. Kattner, S.R. Coriell, Y. A. Chang and B. A. Mueller, in *Modeling of Casting, Welding and Advanced Solidification Processes, VII*, ed. by M. Cross & J. Campbell, TMS, Warrendale, PA, (1995) 649.
 98. "Prediction of Dendritic Microsegregation Patterns Using a Phase-Field Diffuse Interface Model", J. A. Warren and W. J. Boettinger, in *Modeling of Casting, Welding and Advanced Solidification Processes, VII*, ed. by M. Cross & J. Campbell, TMS, Warrendale, PA, (1995) 601.
 99. "Modeling of Heat Flow During Solidification and Melting in a Differential Thermal Analyzer (DTA)", D. K. Banerjee, W. J. Boettinger, R. J. Schaefer, M. E. Williams, in *Modeling of Casting, Welding and Advanced Solidification Processes, VII*, ed. by M. Cross & J. Campbell, TMS, Warrendale, PA, (1995) 491.
 100. "Application of Lukas' Phase Diagram Programs to Solidification Calculations of Multicomponent Alloys", Ursula R. Kattner, William J. Boettinger and Sam R. Coriell, *Z. Metallkunde*, 87 (1996) 522-528.
 101. "Dynamic Aspects of Wetting Balance Tests", K. W. Moon, W. J. Boettinger, M. E. Williams, D. Jossell, B. Murray, W. C. Carter and C. A. Handwerker, *J. Electronic Packaging*, 118 (1996) 174-183.
 102. "Solidification", H. Biloni and W. J. Boettinger, in *Physical Metallurgy*, 4th edition,

edited by P. Haasen and R. W. Cahn, 1996, North Holland, Amsterdam, p. 669-842.

103. "Prediction of Solidification Microstructure using the Phase-Field Method", W. J. Boettinger and J. A. Warren, Proceedings of the General COST512 Workshop on Modelling in Materials Science and Processing, Ed. by M. Rappaz and M Kedro, European Commission , Brussels, 1996, p. 11-20.
104. "Modeling of Micro-/Macrosegregation and Freckle Formation in Single-Crystal Nickel-Base Superlloy Directional Solidification," M.C. Schneider, J.P. Gu, C. Beckermann, W. J. Boettinger and U.R. Kattner, *Met. Mat. Trans. A*, 28A (1997) 1517-1531.
105. "Numerical Simulation of Dendritic Alloy Solidification Using a Phase Field Method," J. Warren and W. J. Boettinger, *Solidification Processing*, 1997, edited by J. Beach and H. Jones, Department of Engineering Materials, University of Sheffield, UK (1997), p.422.
106. "Coupling of Phase Diagram Calculations for Multicomponent Alloys with Solidification Micromodels in Casting Simulation Software," D. K. Banerjee and M. T. Samonds, U. R. Kattner and W. J. Boettinger, *Solidification Processing*, 1997, edited by J. Beach and H. Jones, Department of Engineering Materials, University of Sheffield, UK (1997), p.354.
107. "Modeling Reactive Wetting," J. A. Warren, W. J. Boettinger, A. R. Roosen, in *Design and Reliability of Solders and Solder Interconnections*, R. K. Madhithara et al. eds., TMS, 1997, p.155.
108. "Modeling Reactive Wetting", J. A. Warren, W. J. Boettinger & A. R. Roosen, *Acta Mater.*, 46 (1998) 3247.
109. "Analysis of Solidification Path and Microsegregation in Multicomponent Alloys," W. J. Boettinger, U. R. Kattner, D. K. Banerjee, in *Modeling of Casting, Welding and Advanced Solidification Processes, VIII*, ed. by B. Thomas & C. Beckermann, TMS, Warrendale, PA, (1998) p. 159.
110. "Multiple Similarity Solutions for Solidification & Melting," S. R. Coriell, G. B. McFadden, R. F. Sekerka and W. J. Boettinger, *J. Crystal Growth*, 191 (1998) 573.
111. "Simulation of the Cell to Plane Front Transition during Directional Solidification at High Velocity", W.J. Boettinger and J.A. Warren, *J. Crystal Growth*, 200 (1999) 583.
112. "Solute Trapping and Solute Drag in a Phase Field Model of Rapid Solidification," A. Ahmad, A.A. Wheeler, W. J. Boettinger and G. B. McFadden, *Phys. Rev. E*, 58 (1998) 3436.

113. "Effect of Heating Rate and Grain Size on the Melting Behavior of the Alloy Nb-47 mass% Ti in Rapid Pulse-Heating Experiments," D. Basak, W. J. Boettinger, D. Josell, S. R. Coriell, J. McClure, S. Krishnan and A. Cezairliyan, *Acta Mater.*, 47 (1999) 3147.
114. "On Dendritic Solidification of Multicomponent Alloys with Unequal Liquid Diffusion Coefficients," M. Rappaz and W. J. Boettinger, *Acta Mat.*, 47 (1999) 3205.
115. "Modeling the Fillet Lifting Defect", C. Bailey and W. J. Boettinger, *EEP-Vol. 26-1, Advances in Electronic Packaging – 1999, Volume 1 ASME 1999*, p.405-412.
116. "Solidification Microstructures: Recent Developments, Future Directions," W. J. Boettinger, S. R. Coriell, A. L. Greer, A. Karma, W. Kurz, M. Rappaz and R. Trivedi, *Acta Mat.*, 48 (2000), 43-70.
117. "On the Properties of $\alpha/\alpha+\beta$ Diffusion Couples," W.J. Boettinger, S.R.Coriell, G.B. McFadden and C.A. Campbell, *Acta Mat.*, 48 (2000), 481-492.
118. "Alpha Case Thickness Modeling," W. J. Boettinger, S. R. Coriell, U. R. Kattner, M.E. Williams and B. A. Mueller, *Mat. Trans. B*, 31B (2000), 1419-1427.
119. "Development of a Freckle Predictor via Rayleigh Number Method for Single-Crystal Nickel-Base Superalloy Castings" C. Beckermann, J.P. Gu, and W.J. Boettinger, *Metall. and Mater. Trans. A*: 31A (2000) 2545-2557.
120. "Transient Liquid Phase Bonding in the Ni-Al-B System." C. E. Campbell and W. J. Boettinger, *Metall. Mater. Trans.* 31A (2000) pp. 2835-2847.
121. "Experimental and Thermodynamic Assessment of Sn-Ag-Cu Solder Alloys," K.-W. Moon, W. J. Boettinger, U. R. Kattner, F. S. Biancaniello and C. A. Handwerker, *J. Electronic Materials*, 29 (2000), pp. 1122 - 1136.
122. "The Ternary Eutectic of Sn-Ag-Cu Solder Alloys," K.-W. Moon, W. J. Boettinger, U. R. Kattner, F. S. Biancaniello and C. A. Handwerker, *Proceedings of 2000 SMTA Conference*, (pub. by Surface Mount Technology Assoc. Edina, MN) 2000. p. 941-944.
123. "The Effect of Pb Contamination on the Solidification behavior of Sn-Bi Solders," K.-W. Moon, W. J. Boettinger, U. R. Kattner, C. A. Handwerker and D. -J. Lee, *J. Electronic Materials*, 30 (2001), pp. 45-52.
124. "Thermodynamics and Phase Diagrams" W. J. Boettinger, in *Encyclopedia of Materials: Science & Technology*, K.H.J. Buschow, et al. editors, Elsevier Science Ltd. Oxford (2001).
125. "An Introduction to the Phase-Field Method: Simulation of Alloy Solidification,

- W. J. Boettinger and J. A. Warren, " Proceedings of the Merton C. Flemings Symposium on Solidification and Materials Processing ", edited by R. Abbaschian, H. Brody, and A. Mortensen, TMS, Warrendale, PA, (2001), p. 101-112.
126. "Determination of the CoTi Congruent Melting Point and Re-Assessment of the Co-Ti System, A.V. Davydov, U.R. Kattner, D. Josell, J.E. Blendell, R.M. Waterstrat, A.J. Shapiro and W.J. Boettinger, Metall. and Mater. Trans., 32A (2001) 2175-2186.
127. "Development of a Diffusion Mobility Database for Ni-Base Superalloys, C. A. Campbell, W. J. Boettinger and U. R. Kattner, Acta Mat.50 (2002) 775-792.
128. "Moving the pulsed heating technique beyond monolithic specimens: Experiments with coated wires," D. Josell, D. Basak, J. L. McClure, U. R. Kattner, M. E. Williams, M. Rappaz and W. J. Boettinger, J Mater Res 16 (2001) 2421-2428.
129. "The Formation of Whiskers on Electroplated Sn Containing Cu," K.-W. Moon, M.E. Williams, C.E. Johnson, G.R. Stafford, C.A. Handwerker, and W.J. Boettinger, Proceedings of the Fourth Pacific Rim International Conference on Advanced Materials and Processing, The Japanese Institute of Metals, Sendai, Japan, 2001, S. Hanada, Z. Zhong, S. W. Nam and R. N. Wright, eds., pp. 1115-1118.
130. "Thermodynamic Assessments of the Gallium-Nitrogen System", A. V. Davydov, W. J. Boettinger, U. R. Kattner and T. J. Anderson, Phys. Stat. Sol. A, 188(2001) 407-410.
131. "Phase-Field Simulation of Solidification," W. J. Boettinger, J. A. Warren. C. Beckermann and A. Karma, Annu. Rev. Mater. Res., 32 (2002), 163-194.
132. "On DTA Curves for the Melting and Freezing of Alloys," W. J. Boettinger and U. R. Kattner, Metall. and Matls. Transactions, 33A (2002), 1179.
133. "Mechanism of Fillet Lifting in Sn-Bi Alloys," W. J. Boettinger, C. A. Handwerker, B. Newbury, T.Y. Pan, and J.M. Nicholson, J. Electronic Materials, 31 (2002) 545.
134. "Last Stage Solidification of Alloys: a Theoretical Study of Dendrite Arm and Grain Coalescence," M. Rappaz, A. Jacot and W. J. Boettinger, Met. Mater. Trans. 34A (2003) 467-479
135. "Whisker Formation on Electroplated Sn-Cu", M. E. Williams, C. E. Johnson, K.-W. Moon, G. R. Stafford, C. A. Handwerker, and W. J. Boettinger, Proceedings of the American Electroplaters and Surface Finishers Society (AESF) SUR/FIN 2002 Annual International Technical Conference , The American Electroplaters and Finishers Society, Inc., Orlando FL 2002 pp. 31-39.
136. "EBSD and EDS Study of the Phase NiSn₄," W. J. Boettinger, M. D. Vaudin, M.

- E. Williams and L. A. Bendersky, *J. Electronic Materials*, 32 (2003), 511-515.
137. "Phase Field Models for Eutectic Solidification," D. J. Lewis, T. Pusztai, L. Granasy, J. A. Warren W. J. Boettinger, *Journal of Metals*, 56 (4): 2004, 34-39.
138. "Combinatorial Investigation of Structural Quality of Au/Ni Contacts on GaN," A.V. Davydov, L.A. Bendersky, W.J. Boettinger, D. Josell, M.D. Vaudin, K.-S. Chang and I. Takeuchi, *Applied Surface Science*, 223 (2004) 24–29.
139. "Databases for Computational Thermodynamics and Diffusion," U. R. Kattner, W. J. Boettinger and J. E. Morall, *J. Phase Equilibria*, 24 (2003) 416-421.
140. "Three Dimensional Phase Field Modeling of Binary Eutectics, D. J. Lewis, W. J. Boettinger and J. A. Warren, in *Modeling of Casting, Welding and Advanced Solidification Processes, X*, ed. by Stefanescu, DM, Warren, JA, Jolly, MR, and Krane, JM, TMS, Warrendale, PA, (2003), 5-12.
141. "Phase Field Modeling of Electrochemistry I: Equilibrium," J. E. Guyer, W. J. Boettinger, J. A. Warren, G. B. McFadden, *Phys. Rev. E* 69, 021603 (2004).
142. "Phase Field Modeling of Electrochemistry II: Kinetics," J. E. Guyer, W. J. Boettinger, J. A. Warren, G. B. McFadden, *Phys. Rev. E* 69, 021604 (2004).
143. "Rapid Melting of Nb-47 mass% Ti: Effect of Heating Rate and Grain Size," W. J. Boettinger, D. Josell, S R. Coriell, and D. Basak, in *Solidification Processes and Microstructures*, edited by M. Rappaz, C. Beckermann and R. Trivedi, TMS, Warrendale PA (2004) 87-98.
144. "Contribution to the Zr-Rich Part of the Zn-Zr Phase Diagram," M. E. Williams, W. J. Boettinger, and U. R. Kattner, *Journal of Phase Equilibria and Diffusion*, 25 (2004) 355-363.
145. "Accurately Determining Eutectic Compositions: The Sn-Ag-Cu ternary eutectic," Moon K.W., Boettinger W. J., *Jour. of Metals* 56 (4): 2004, 22-27.
146. "Realization of Improved Metallization-Ti/Al/Ti/W/Au Ohmic Contacts to n-GaN for High Temperature Application," A. Motayed, A.V. Davydov, W. J. Boettinger, D. Josell, A.J. Shapiro, I. Levin, T. Zheleva, G. L. Harris, *Phys. Stat. Sol.(c)*, *Phys. Stat. Sol.(c)*, 2 (2005) 2536–2539.
147. "Combinatorial optimization of Ti/Al/Ti/Au ohmic contacts to n-GaN," A.V. Davydov, A. Motayed, W.J. Boettinger, R.S. Gates, , Q. Z. Xue, H. C. Lee, Y. K. Yoo, *Phys. Stat. Sol.(c)*, 2 (2005) 2551-2554.
148. "A Model for the Lateral Deformation of Diffusion Couples, W. J. Boettinger, G. B. McFadden, S. R. Coriell, R. F. Sekerka, and J. A. Warren," *Acta Materialia*, 53

(2005) 1995-2008.

149. "Observed Correlation of Sn Oxide film to Sn Whisker Growth in Sn-Cu Electrodeposits for Pb-Free Solders," K.-W. Moon, C.E. Johnson, M. E. Williams, O. Kongstein, G. R. Stafford, C.A. Handwerker and W. J. Boettinger, *J. Electronic Materials*, 34 (2005) L31-L33.
150. "Whisker & Hillock Formation on Sn, Sn-Cu and Sn-Pb Electrodeposits," W. J. Boettinger, C. E. Johnson, L. A. Bendersky, K.-W. Moon, M. E. Williams and G. R. Stafford, *Acta Materialia*, 53 (2005) 5033–5050.
151. "Microstructural Characterization of Al-7075 T651 Chips and Work Pieces Produced by High Speed Machining," C. E. Campbell, R. W. Ivester, W. J. Boettinger, L. A. Bendersky, *Materials Science and Engineering A* 430(2006) 15-26.
152. "Examination of Multicomponent Diffusion Between Two Ni-Base Superalloys," W. J. Boettinger, C. E. Campbell, T. Hansen, P. Merewether, B. A. Mueller, in *Complex Inorganic Solids: Structural, Stability and Magnetic Properties*, ed. by P. E. A. Turchi, A. Gonis, K. Rajan, and A. Meike, (Springer Science, New York, 2005), p. 241-250.
153. "Numerical Modeling of Diffusion-induced Deformation," J. A. Dantzig, W. J. Boettinger, J. A. Warren, G. B. McFadden, S. R. Coriell and R. F. Sekerka, *Metallurgical and Materials Transactions A*, 37(2006) 2701-2714.
154. "Whisker Formation in Pb-free Surface Finishes", Stafford, G.R., Williams, M.E.; Johnson, C.E.; Moon, K.-W.; Bertocci, U.; Kongstein, O.; Boettinger W. J. , *ECS Transactions*, v 1, n 13, Green Electrodeposition., pp. 71-85, 2006.
155. "Recommended Practice Guide: DTA & Heat-Flux DSC Measurement of Alloy Melting and Freezing, W. J. Boettinger, U. R. Kattner, K. –W. Moon and J. H. Perepezko, NIST Special Publication 960-15. November 2006.
156. "DTA & Heat-Flux DSC Measurement of Alloy Melting and Freezing," W. J. Boettinger, U. R. Kattner, K. –W. Moon and J. H. Perepezko, in "Methods for Phase Diagram Determination," edited by J. –C. Zhao, Elsevier, Oxford, 2007, pp 151-221.
157. "Computation of the Kirkendall Velocity and Displacement Field in a 1-D Diffusion Couple with a Moving Interface," W. J. Boettinger, J.E. Guyer, G.B.McFadden and C.E. Campbell, *Proc. R. Soc. A* (2007) 463, 3347–3373.
158. "The pre-wetting transition at anti-phase boundaries: an atomistic modeling study of Ni₃Al." Becker, C. A., Mishin, Y., and Boettinger, W. J., *J. Matls. Sci.*, in press May, 2008.
159. "Rapid Solidification," W. J. Boettinger, in ASM Handbook, 2007 Edition,

Volume 15 - Casting, article 3P, in press 9/27/2007.

160. "Hillock and Whisker growth on Sn and SnCu Electrodeposits on a substrate not forming interfacial intermetallic compounds," M.E. Williams, K.W. Moon, W.J., Boettinger, D. Josell and A.D. Deal, *J. Elec. Matls* 36(2007) 214-219.