

ROBERT FLOYD SEKERKA
Carnegie Mellon University
PUBLICATIONS

Compiled by Robert F. Sekerka*

September 3, 2015

1. R. F. Sekerka, G. F. Bolling and W. A. Tiller, "Observations of Macromosaic Substructures in Lead," *Canadian Journal of Physics* **38**, 883-885 (1960).
2. W. W. Mullins and R. F. Sekerka, "Application of Linear Programming Theory to Crystal Faceting," *J. Phys. Solids* **23**, 801-803 (1962).
3. W. W. Mullins and R. F. Sekerka, "Morphological Stability of a Particle Growing by Diffusion or Heat Flow," *Journal of Applied Physics* **34**, 323-329 (1963).
4. W. W. Mullins and R. F. Sekerka, "Stability of a Planar Interface During Solidification of a Dilute Binary Alloy," *Journal of Applied Physics* **35**, 444-451 (1964).
5. W. A. Tiller and R. F. Sekerka, "Redistribution of Solute During Phase Transformations," *Journal of Applied Physics* **35**, 2726-2729 (1964).
6. R. F. Sekerka, "A Stability Function for Explicit Evaluation of the Mullins-Sekerka Interface Stability Criterion," *Journal of Applied Physics* **36**, 264-268 (1965).
7. R. F. Sekerka, "The Theory of Magnetic Relaxation in Rare Earth Iron Garnets with Application to Europium Iron Garnet," *Doctoral Thesis, Harvard University, 1965.* [BOOKSHELF]
8. R. F. Sekerka and W. A. Tiller, "Mathematical Analysis of the Thermal Wave Technique for Linear Kinetics," *Journal of Chemical Physics* **44**, 3829-3833 (1966).
9. R. F. Sekerka, "A Time-Dependent Theory of Stability of a Planar Interface During Dilute Binary Alloy Solidification," in *Crystal Growth*, H. Steffen Peiser, Editor, Proceedings of an International Conference on Crystal Growth, Boston, 20-24 June 1966, Pergamon Press, 691-702 (1967).

*University Professor Emeritus of Physics, Mathematics and Materials Science, Carnegie Mellon University. Comments in square brackets denote preprints or missing copies of a paper archive.

10. R. F. Sekerka, "Application of the Time-Dependent Theory of Interface Stability to an Isothermal Phase Transformation," *Journal of the Physics and Chemistry of Solids* **28**, 983-994 (1967).
11. R. F. Sekerka, "Mathematical Analysis of the Thermal Wave Technique for Square Law Kinetics," *Journal of Chemical Physics* **46**, 2341-2351 (1967).
12. D. W. James and R. F. Sekerka, "The Effect of Impurities on Solidification Kinetics Measured by the Thermal Wave Technique," *Journal of Crystal Growth* **1**, 67-72 (1967).
13. R. F. Sekerka, "Morphological Stability," *Journal of Crystal Growth* **3,4**, 71-81 (1968).
14. R. F. Sekerka, "Some Aspects of Morphological Stability," *Bulletin Societe Francaise de Mineralogie et de Cristallographie* **92**, 540-546 (1969).
15. R. F. Sekerka, "Ferromagnetic Resonance Frequency in Anisotropic Crystals for Arbitrarily Oriented Field," *Physics Letters* *29A*, 560-561 (1969).
16. M. E. Foglio and R. F. Sekerka, "Anisotropic Exchange and the Resonance Linewidth of Europium Iron Garnet," *Journal of Applied Physics* **41**, 1113 (1970).
17. R. F. Sekerka, "A Green's Function to Describe the Time-Dependent Shape of a Morphologically Unstable Solid-Liquid Interface During Solidification," *Journal of Crystal Growth* **10**, 239-250 (1971).
18. S. R. Coriell, S. C. Hardy and R. F. Sekerka, "A Non-Linear Analysis of Experiments on the Morphological Stability of Ice Cylinders Freezing from Aqueous Solutions," *Journal of Crystal Growth* **11**, 53-67 (1971).
19. R. F. Sekerka and M. E. Glicksman, "Solidification Kinetics," Chapter 8 in *Problems in Materials Science*, Harish D. Merchant, editor, Gordon & Breach, New York, 169-191 (1972).
20. S. R. Coriell and R. F. Sekerka, "Morphological Stability Near a Grain Boundary Groove in a Solid-Liquid Interface During Solidification of a Pure Substance," *Journal of Crystal Growth* **19**, 90-104 (1972).
21. D. R. Coriell and R. F. Sekerka, "Morphological Stability Near a Grain Boundary Groove in a Solid-Liquid Interface," published in POCT KP CTALOB IX, Proceedings of USSR Conference on Crystal Growth, Tsakhkkadzor, Armenia SSR, 230-248 (1972). [Russian translation of publication 20.]
22. R. F. Sekerka, "Morphological Stability," Chapter 15 in *Crystal Growth: An Introduction*, P. Hartman, editor, North-Holland, 403-443, 1973.

23. S. R. Coriell and R. F. Sekerka, "Morphological Stability Near a Grain Boundary Groove in a Solid-Liquid Interface During Solidification of a Binary Alloy," *Journal of Crystal Growth* **19**, 285-290 (1973).
24. T. Fujioka and R. F. Sekerka, "Morphological Stability of Disc Crystals," *Journal of Crystal Growth* **24/25**, 84-93 (1974).
25. M. E. Foglio, R. F. Sekerka, and J. H. Van Vleck, "Theory of the Width of the Ferromagnetic Resonance Line of Europium Iron Garnet," *Proc. R. Soc. (London) A.* **344**, 21-50 (1975).
26. M. S. Masteller, R. W. Heckel, and R. F. Sekerka, "A Mathematical Model Study of the Influence of Degree of Mixing and Powder Particle Size Variation on the Homogenization Kinetics of Compacted Blends of Powders," *Met. Trans.* **6A**, 869-876 (1975).
27. J. S. Langer and R. F. Sekerka, "Theory of Departure from Local Equilibrium at the Interface of a Two-Phase Diffusion Couple," *Acta Met.* **23**, 1225-1237 (1975).
28. R. F. Sekerka, C. L. Jeanfils, and R. W. Heckel, "The Moving Boundary Problem," Chapter 4 in *Lectures on the Theory of Phase Transformations*, H. I. Aaronson, editor, AIME, 117-169, 1975.
29. S. R. Coriell, D. T. J. Hurle, and R. F. Sekerka, "Interface Stability During Crystal Growth: The Effect of Stirring," *Journal of Crystal Growth* **32**, 1-7, (1976).
30. S.R. Coriell, and R. F. Sekerka, "The Effect of the Anisotropy of Surface Tension and Interface Kinetics on Morphological Stability," *Journal of Crystal Growth* **34**, 157-163 (1976).
31. R. F. Sekerka, R. F., "On the Modeling of Solid-Fluid Interface Dynamics," *Proc. of the Darken Conference, United States Steel Research Laboratory, Monroeville, PA*, 301-321 (1976).
32. J. S. Langer, R. F. Sekerka, and T. Fujioka, "Evidence for a Universal Law of Dendritic Growth Rates," *Journal of Crystal Growth* **44**, 414-418 (1978).
33. T. F. Marinis and R. F. Sekerka, "A Model for Capillary Induced Instabilities in Directionally Solidified Eutectic Alloys," *Proceedings of the Conference on In Situ Composites - III*, Materials Research Society Annual Meeting, Boston, Mass., November 1978, J. L. Walter, M. F. Gigliotti, B. F. Oliver, H. Bibring, editors., Ginn Custom Publishing, Lexington, MA, 86-94 (1979).
34. S. R. Coriell and R. F. Sekerka, "Lateral Solute Segregation During Unidirectional Solidification of a Binary Alloy with a Curved Solid-Liquid Interface," *Journal of Crystal Growth* **46**, 479-482 (1979).

35. R. F. Sekerka and S. R. Coriell, "Influence of the Space Environment on Some Materials Processing Phenomena," *Proceedings of the Symposium on Materials Sciences in Space*, European Space Agency, Grenoble, France, 55-65, (1979).
36. S. R. Coriell, M. R. Cordes, W. J. Boettinger and R. F. Sekerka, "Convective and Interfacial Instabilities During Unidirectional Solidification of a Binary Alloy," *Journal of Crystal Growth* **49**, 13-28 (1980).
37. S. R. Coriell and R. F. Sekerka, "Interface Stability During Rapid Solidification," *Proceedings of the 2nd International Conference on Rapid Solidification Processing*, Reston, Virginia, pp. 35-49 (1980).
38. S. R. Coriell, M. R. Cordes, W. J. Boettinger and R. F. Sekerka, "Effect of Gravity on Coupled Convective and Interfacial Instabilities During Directional Solidification," *Proceedings of the COSPAR Conference, Budapest, Hungary, June 1980*, *Advances in Space Research*, 5-11 (1981)
39. R. F. Sekerka, R. A. Hartzell and B. J. Farr, "Instability Phenomena During the RF Heating and Melting of Ceramics," *Journal of Crystal Growth* **50**, 783-800 (1980).
40. R. F. Sekerka and W. W. Mullins, "Proof of the Symmetry of the Transport Matrix for Diffusion and Heat Flow in Fluid Systems," *Journal of Chemical Physics* **73**, 1413-1421 (1980).
41. S.R. Coriell, R. F. Boisvert, R. G. Rehn and R. F. Sekerka, "Lateral Solute Segregation During Unidirectional Solidification of a Binary Alloy with a Curved Solid-Liquid Interface II: Large Departures from Planarity," *Journal of Crystal Growth* **54**, 167-175 (1981).
42. W. W. Mullins and R. F. Sekerka, "On the Validity of the Onsager Reciprocal Relations," *Viewpoint Set No. 3, Scripta Metallurgica* **15**, 29-33 (1981).
43. S. R. Coriell and R. F. Sekerka, "Effect of Convective Flow on Morphological Stability," *Special Issue, PhysicoChemical Hydrodynamics*, Pergamon Press, D. T. J. Hurle and E. Jakeman, editors, **2**, 281-293 (1981).
44. R. A. Hartzell and R. F. Sekerka, "Mathematical Modeling of Internal Centrifugal Zone Growth of Ceramics and Metal-Ceramic Composites," *Journal of Crystal Growth* **57**, 27-42 (1982).
45. R. F. Sekerka, "Melt Growth," *Proceedings International School of Crystallography, 7th Course: Interfacial Aspects of Phase Transformation*, Erice-Trapani, Sicily, D. Reidel Publishing Co., 489-508 (1982).
46. R. F. Sekerka and T. F. Marinis, "Dynamics of Morphological Change During Solid-Solid Transformations," *Proceedings International Conference on Solid-Solid Phase Transformations*, H. I. Aaronson, D. E. Laughlin, R. F. Sekerka and C. M. Wayman, editors, TMS-AIME, Warrendale, Pa., 67-84 (1982)

47. S. R. Coriell and R. F. Sekerka, "Oscillatory Morphological Instabilities Due to NonEquilibrium Segregation," *Journal of Crystal Growth* **61**, 499-508 (1983).
48. R. F. Sekerka, "The Effect of Solidification Rate on Morphological Stability," *Proceedings of U.S.-Japan Cooperative Science Program Program Seminar on "Solidification Processing*, Dedham, Massachusetts, 15-29 (1983)
49. W. J. Boettinger, S. R. Coriell and R. F. Sekerka, "Mechanisms of Microsegregation-Free Solidification," *Proceedings of Rapid Solidification Processing: Principles and Technologies (III)*, R. Mehrabian, editor, NBS Internal Report (1983), and *Materials Science and Engineering*, special issue on Solidifications Microstructure, H. Jones and W. Kurz, editors, **65**, 27-36 (1984).
50. P. W. Voorhees, S. R. Coriell, G. B. McFadden and R. F. Sekerka, "The Effect of Anisotropic Crystal Melt Surface Tension on Grain Boundary Groove Morphology," *Journal of Crystal Growth* **67**, 425-440 (1984).
51. S. R. Coriell, G. B. McFadden, R. F. Boisvert and R. F. Sekerka, "Effect of a Forced Couette Flow on Coupled Convective and Morphological Instabilities During Unidirectional Solidification," *Journal of Crystal Growth* **69**, 15-22 (1984).
52. R. F. Sekerka, "Morphological and Hydrodynamic Instabilities During Phase Transformations," extended abstract, *Physica* **12D**, 212-214 (1984).
53. R. F. Sekerka, "Morphological Instabilities During Phase Transformations," in *Phase Transformations and Materials Instabilities in Solids*, Morton E. Gurtin, editor, Academic Press, Inc. 147-162 (1984).
54. W. W. Mullins and R. F. Sekerka, "On the Thermodynamics of Crystalline Solids," *Journal of Chemical Physics* **82**, 5192-5202 (1985).
55. J. Iwan D. Alexander, P. H. Leo and R. F. Sekerka, "Elastic Fields About a Perturbed Cylindrical Inclusion," *Acta Metallurgica* **33**, 975-983 (1985).
56. P. H. Leo, J. Iwan D. Alexander and R. F. Sekerka, "The Elastic Fields About a Perturbed Spherical Inclusion," *Acta Metallurgica* **33**, 985-989 (1985).
57. S. R. Coriell, G. B. McFadden and R. F. Sekerka, "Cellular Growth During Directional Solidification," *Annual Review of Materials Science* **15**, 119-145 (1985).
58. R. F. Sekerka, "Phase Interfaces: Morphological Stability, *Encyclopedia of Materials Science & Engineering*, Robert W. Cahn, subject editor, Physical Metallurgy: Theory, Michael B. Bever, editor-in-chief, Pergamon Press, 3486-3493, 1986.
59. J. Iwan D. Alexander, David J. Wollkind and Robert F. Sekerka, "The Effect of Latent Heat on Weakly Non-Linear Morphological Stability," *Journal of Crystal Growth* **79**, 849-865, 1986.

60. R. F. Sekerka, "Comments on Crystal Growth," Chapter 4B in *Opportunities for Academic Research in a Low-Gravity Environment*, George A. Hazelrigg and Joseph M. Reynolds, editors, Progress in Astronautics and Aeronautics, American Institute of Aeronautics and Astronautics, Inc., New York, **108**, 145-150, 1986.
61. Robert F. Sekerka, "Milestones in Crystal Growth: The Theory of Morphological Stability," AACG Newsletter **16**, 2-4 (1986).
62. S. R. Coriell, G. B. McFadden, P. W. Voorhees, and R. F. Sekerka, "Stability of a Planar Interface During Solidification of a Multicomponent System," Journal of Crystal Growth **82**, 295-302 (1987).
63. R. F. Sekerka and S. R. Coriell, "Coupled Morphological and Convective Instabilities in a Microgravity Environment," *Proceedings of the Sixth European Symposium on Material Sciences under Microgravity Conditions*, jointly organized by the European Space Agency and the Centre National d'Etudes Spatiales, Bordeaux, France, December 1986, 3-11 (1987).
64. R. F. Sekerka, P. W. Voorhees, S. R. Coriell and G. B. McFadden, "Initial Conditions Implied by $t^{1/2}$ Solidification of a Sphere with Capillarity and Interfacial Kinetics," Journal of Crystal Growth **87**, 415-420 (1988).
65. R. F. Sekerka and Jorge Viñals, "Jump Rates for Vacancy Diffusion in a Lennard-Jones Solid Under Non-Hydrostatic Stress," Physical Review **B37**, 10697-10707 (1988).
66. J. Viñals, R. F. Sekerka and P. P. Debroy, "Morphological Stability Analysis of Directional Solidification in Thin Samples with Lateral Heat Transfer," Journal of Crystal Growth **89**, 405-414 (1988).
67. G. B. McFadden, S. R. Coriell and R. F. Sekerka, "Effect of Surface Tension Anisotropy on Cellular Morphologies," Journal of Crystal Growth **91**, 180-198 (1988).
68. S. R. Coriell, G. B. McFadden and R. F. Sekerka, "Convective and Interfacial Instabilities During Solidification," *Physicochemical Hydrodynamics*, Manuel G. Velarde, editor., Plenum Publishing Corporation, 559-569 (1988).
69. L. N. Brush and R. F. Sekerka, "A Numerical Study of Two-Dimensional Crystal Growth Forms in the Presence of Anisotropic Growth Kinetics," Journal of Crystal Growth **96**, 419-441 (1989).
70. P. H. Leo and R. F. Sekerka, "The Effect of Surface Stress on Crystal-Melt and Crystal-Crystal Equilibrium," Acta Metallurgica **37**, 3119-3138 (1989).
71. P. H. Leo and R. F. Sekerka, "The Effect of Elastic Fields on the Morphological Stability of a Precipitate Grown from Solid Solution," Acta Metallurgica **37**, 3139-3149 (1989).

72. L. N. Brush, R. F. Sekerka and G. B. McFadden, "A Numerical and Analytical Study of Nonlinear Bifurcations Associated with the Morphological Stability of Two-Dimensional Single Crystals," *Journal of Crystal Growth* **100**, 89-108 (1990).
73. J. Viñals and R. Sekerka, "Effect of G-Jitter on the Spectrum of Excitations of a Free Fluid Surface: Stochastic Formulation," AIAA 90-0652, 28th Aerospace Sciences Meeting, Reno, Nevada, January 1990.
74. P. H. Leo, W. W. Mullins, R. F. Sekerka and J. Viñals, "Effect of Elasticity on Late Stage Coarsening", *Acta metall. mater.* **38**, 1573-1580 (1990).
75. S. R. Coriell, G. B. McFadden, and R. F. Sekerka, "Effect of Anisotropic Thermal Conductivity on the Morphological Stability of a Binary Alloy," *J. Crystal Growth*, **100**, 459-466 (1990).
76. S. R. Coriell, G. B. McFadden and R. F. Sekerka, "The effects of crystalline anisotropy and buoyancy-driven convection on morphological stability", *Proceedings of the F. Weinberg International Symposium on Solidification Processing*, Hamilton, Ontario, August 27-29, 1990, edited by J. E. Lait and I. V. Samaresekera, Pergamon Press, 44-51 (1990).
77. J. M. Rickman, Jorge Viñals and R. F. Sekerka, "Molecular dynamics study of the effects of strain on interstitial diffusion in a hard-sphere model of a binary crystalline solid", *Phys Rev.* **B43**, 8251-8263 (1991).
78. S. C. Hardy, G. B. McFadden, S. R. Coriell, P. W. Voorhees and R. F. Sekerka, "Measurement and analysis of grain boundary grooving by volume diffusion", *J. Crystal Growth* **114**, 467-480 (1991).
79. J. M. Rickman, Jorge Viñals, R. F. Sekerka and W. W. Mullins, "Effects of long-range crystalline order on collective diffusion in binary solids", *Phys. Rev.* **B45**, 7750-7761 (1992).
80. J. Viñals and R. Sekerka, "Effective Diffusion Equation in a Random Velocity Field", *Proceedings of the AIAA Aerospace Sciences Meeting*, Reno, Nevada, January (1991).
81. Etsuro Yokoyama and Robert F. Sekerka, "A numerical study of the combined effect of anisotropic surface tension and interface kinetics on pattern formation during the growth of two-dimensional crystals", *J. Crystal Growth* **125**, 389-403 (1992).
82. Robert F. Sekerka and Etsuro Yokoyama, "Modeling of Two-Dimensional Crystal Growth with Anisotropic Surface Tension and Kinetics," in *Communications 3S-92, Symposium on Surface Science, LaPlagne, Savoie/ France*, March 15-21, (1992).
83. Robert F. Sekerka and Partha P. Debroy, "Weakly Nonlinear Morphological Stability Analysis of a Sphere Crystallizing From an Undercooled Melt," in *Interactive Dynamics of Convection and Solidification*, S, H, Davis, editor, Kluwer Academic, Netherlands, 53-55, (1992).

84. Robert F. Sekerka, "Role of Instabilities in Determination of the Shapes of Growing Crystals, *J. Crystal Growth* **128**, 1-12 (1993).
85. S-L Wang, R. F. Sekerka, A. A. Wheeler, B. T. Murray, S. R. Coriell, R. J. Braun and G. B. McFadden, "Thermodynamically-Consistent Phase Field Models for Solidification, *Physica* **D69**, 189-200 (1993).
86. J. Casademunt, W. Zhang, Viñals and R. F. Sekerka, "Stability of a Fluid Surface in a Microgravity Environment," *AIAA Journal* **31** 2027-2031 (1993).
87. G. B. McFadden, A. A. Wheeler, R. J. Braun, S. R. Coriell and R. F. Sekerka, "Phase-Field Models for Anisotropic Interfaces, *Phys. Rev.* **E48** 2016-2024 (1993).
88. R. F. Sekerka, "Role of Fluctuations in the Determination of Crystal Growth Morphology," *Proceedings of the EWSSW 94, February 14-21, Pamparovo, Bulgaria, "Thin Films and Phase Transitions of Surfaces,"* M. Michailov and I. Gutzow, editors., Institute of Physical Chemistry, Bulgarian Academy of Sciences, Sofia, 7-20 (1994).
89. Partha P. Debroy and Robert F. Sekerka, "Weakly nonlinear morphological instability of a spherical crystal growing from a pure undercooled melt, *Phys. Rev.* **E51** 4608-4620 (1995)
90. Bayard K. Johnson, Robert F. Sekerka and Michael P. Foley, "Scaling of Fractal Aggregates," *Phys. Rev.* **E52** 796-800 (1995).
91. Robert F. Sekerka, "Optimum Stability Conjecture for the Role of Interface Kinetics in Selection of the Dendrite Operating State," *J. Crystal Growth* **154** 377-385 (1995).
92. R. F. Sekerka, S. R. Coriell and G. B. McFadden, "Stagnant Film Model of the Effect of Natural Convection on the Dendrite Operating State," *J. Crystal Growth* **154** 370-376 (1995).
93. Bayard K. Johnson and Robert F. Sekerka, "Diffusion Limited Aggregation: Connection to a Free Boundary Problem with Lattice Anisotropy, *Phys. Rev.* **E52**, 6404-6414 (1995).
94. Shun-Lien Wang and Robert F. Sekerka, "Computation of the Dendritic Operating State at Large Supercoolings by the Phase Field Model," *Phys. Rev.* **E53** 3760-3776 (1996).
95. Shun-Lien Wang and Robert F. Sekerka, "Algorithms for Phase Field Computation of the Dendritic Operating State at Large Supercoolings," *J. Computational Phys.* **127** 110-117 (1996).
96. Partha P. Debroy and Robert F. Sekerka, "Weakly nonlinear morphological instability of a cylindrical crystal growing from a pure undercooled melt," *Phys. Rev.* **E53** 6244-6252 (1996).

97. P. S. Perera and R. F. Sekerka, "Non-Solenoidal Flow in a Liquid Diffusion Couple, *Physics of Fluids* **9** 376-391 (1997).
98. R. F. Sekerka, S. R. Coriell and G. B. McFadden, "The Effect of Container Size on Dendritic Growth in Microgravity," *J. Crystal Growth* **171** 303-306 (1997).
99. R. F. Sekerka, S. R. Coriell and G. B. McFadden, "Erratum to Stagnant Film Model of the Effect of Natural Convection on the Dendrite Operating State," *J. Crystal Growth* **173** 597 (1997).
100. K. Tsukamoto, E. Yokoyama, S. Maruyama, K. Maiwa, K. Shimizu, R. F. Sekerka, T. S. Morita and S. Yoda, "Transient Crystall Growth Rate in Microgravity: Report from TR-IA-4 Rocket Experiment," *J. Japan Microgravity Appl.* **15** 2-9 (1998).
101. S. R. Coriell, G. B. McFadden, R. F. Sekerka and W. J. Boettinger, "Multiple similarity solutions for solidification and melting," *J. Crystal Growth* **191** 573-585 (1998).
102. Zhiqiang Bi and Robert F. Sekerka, "Phase-field model of solidification of a binary alloy," *Physica* **A261** 95-106 (1998).
103. S. R. Coriell, G. B. McFadden and R. F. Sekerka, "Selection mechanism for multiple similarity solutions for solidification and melting," *J. Crystal Growth* **200** 276-286 (1999).
104. Stanislav G. Pavlik and Robert F. Sekerka, "Forces due to fluctuations in the anisotropic phase-field model of solidification," *Physica A* **268** 283-290 (1999).
105. Bayard K. Johnson, Robert F. Sekerka and Robert Almgren, "Thermodynamic basis for a variational model for crystal growth," *Phys. Rev.* **E60** 705-714 (1999).
106. G. B. McFadden, R. R. Coriell and R. F. Sekerka, "Analytic Solution for a Non-Axisymmetric Isothermal Dendrite," *J. Crystal Growth* *208* 726-745 (2000).
107. Etsuro Yokoyama, Robert F. Sekerka and Yoshinori Furukawa, "Growth Trajectories of Disk Crystals of Ice Growing from Supercooled Water," *J. Phys. Chem.* **B104** 65-67 (2000)
108. Stanislav G. Pavlik and Robert F. Sekerka, "Fluctuations in the phase field model of solidification," *Physica A* **277** 415-431 (2000)
109. G.B. McFadden, S.R. Coriell and R.F. Sekerka, "Effect of Surface Free Energy Anisotropy on Dendrite Tip Shape," *Acta Mater.* **48** 3177-3181 (2000)
110. Timothe L. Pourpoint, R. Michael Banish, Francis C. Wessling and Robert F. Sekerka, "Real-time determination of thermal diffusivity in a disk shaped sample - applications to graphite and boron nitride," *Review of Scientific Instruments* **71** 4512-4520 (2000).

111. Robert F. Sekerka and Shun-Lien Wang, "Moving Phase Boundary Problems," in *Lectures on the Theory of Phase Transformations*, second edition, H.I. Aaronson, editor, TMS, Warrendale, PA 231-284 (2000).
112. R. F. Sekerka and Victor C. Sofonea, "Lattice Boltzmann computations of binary diffusion in liquids under stochastic microgravity," *Proceedings of the Microgravity Materials Science Conference*, Huntsville, Alabama, June (2000).
113. V. Sofonea and R. F. Sekerka, "BGK models for diffusion in isothermal binary fluid systems," *Physica* **A299** 494-520 (2001).
114. Robert F. Sekerka, "Round Table on Achievements and Prospects of Research in Physical Sciences in Space," *Proceedings from the First International Symposium on Microgravity & Applications in Physical Sciences & Biotechnology*, Sorrento, Italy (ESA SP-454, January) 25 (2001).
115. Robert F. Sekerka and Victor M. Sofonea, "Effect of Convection on Diffusion in Liquids in Microgravity," *Proceedings from the First International Symposium on Microgravity & Applications in Physical Sciences & Biotechnology*, Sorrento, Italy (ESA SP-454, January) 31 (2001)
116. Robert F. Sekerka, "Fundamentals of phase field theory," in *Advances in Crystal Growth Research*, K. Sato, Y. Furukawa and K. Nakajima, editors., Elsevier, Amsterdam, 21-41 (2001)
117. R.F. Sekerka, S.R. Coriell, and G.B. McFadden, "Separation of scales of an alloy dendrite," *Metallurgical and Materials Transactions* **32A** 2669-2670 (2001).
118. Zhiquang Bi and Robert F. Sekerka, "Phase Field Modeling of Shallow Cells during Directional Solidification of A Binary Alloy", *J. Crystal Growth* **237-239** 138-143 (2002).
119. Robert F. Sekerka and Zhiquang Bi, "Phase Field Model of Multicomponent Alloy Solidification with Hydrodynamics," in *Interfaces for the Twenty-First Century*, M. K. Smith, M. J. Miksis, G. B. McFadden, P. K. Neitzel and D. R. Canright, editors, Imperial College Press, London, 147-166 (2002).
120. R.F. Sekerka and Victor C. Sofonea, "Lattice Boltzmann computations of binary diffusion in liquids under stochastic microgravity," *Proceedings of the Microgravity Materials Science Conference 2002*, Huntsville, Alabama, June (2002).
121. T. Uehara and R.F. Sekerka, "Evaluation of Phase-Field Parameters by Molecular Dynamics Simulations of Crystal Growth," *Proceedings of ICES02 International Conference on Computational Engineering and Science*, July 31-August 2, Reno, Nevada, (2002).
122. Victor Sofonea and Robert F. Sekerka, "Viscosity of finite difference lattice Boltzmann models," *J. Computational Physics* **184** 422-434 (2003).

123. Takuya Uehara and Robert F. Sekerka, "Phase field simulations of faceted growth for strong anisotropy of kinetic coefficient," *J. Crystal Growth* **254** 251-261 (2003).
124. R. F. Sekerka, "The theory of morphological stability," reprinted from "Milestones in Crystal Growth: The theory of morphological stability," AACG Newsletter, bf 16 1-3 (1986), *50 years Progress in Crystal Growth*, R. S. Feigelson, editor, Elsevier, 81-86 (2004).
125. Robert F. Sekerka, "Similarity Solutions for a Binary Diffusion Couple with Diffusivity Dependent on Composition," *Progress in Materials Science* **49** 511-536 (2004).
126. Robert F. Sekerka, "Morphology: From Sharp Interface to Phase Field Models," *J. Crystal Growth* **264** 530-540 (2004); also published in *50 years Progress in Crystal Growth*, R. S. Feigelson, editor, Elsevier, 81-86 (2004).
127. Robert F. Sekerka and John W. Cahn, "Solid-Liquid Equilibrium for Non-Hydrostatic Stress," *Acta Materialia* **52** 1663-1668 (2004).
128. Robert F. Sekerka, "Theory of Crystal Growth Morphology," in *Crystal Growth From Fundamentals to Technology*, G. Müller, J.J. Metois, and P. Rudolph, editors, Elsevier, Amsterdam, 55-93 (2004).
129. Robert F. Sekerka, "Analytical criteria for missing orientations on three-dimensional equilibrium shapes," *J. Crystal Growth* **275** 77-82 (2005).
130. Robert F. Sekerka, "Equilibrium and growth shapes of crystals: how do they differ and why should we care?," (Czocharlski Lecture, Zakopane, Poland), *Crystal Research Technology* **40** 291-306 (2005).
131. Victor Sofonea and Robert F. Sekerka, "Boundary conditions for the upwind finite difference Lattice Boltzmann model: evidence of slip velocity in micro-channel flow," *J. Computational Physics* **207** 639-659 (2005).
132. Victor Sofonea and Robert F. Sekerka, "Diffusivity of Two Component Isothermal Finite Difference Lattice Boltzmann Models," *International Journal of Modern Physics C* **16** 1075-1090 (2005).
133. Victor Sofonea and Robert F. Sekerka, "Diffuse reflection boundary conditions for a thermal lattice Boltzmann model in two dimensions: evidence of temperature jump and slip velocity in micro-channels," *Phys. Rev.* **E71** 066709-1-10 (2005).
134. W.J. Boettinger, G.B. McFadden, S.R. Coriell, R.F. Sekerka and J.A. Warren, "Lateral deformation of diffusion couples," *Acta Materialia* **53** 1995-2008 (2005).
135. J.A. Dantzig, W.J. Boettinger, J.A. Warren, G.B. McFadden, S.R. Coriell, and R.F. Sekerka, "Numerical Modeling of Diffusion-induced Deformation," *Met Trans* **A37** 2701- 2714 (2006).

136. Robert F. Sekerka, "Phase Field Modeling of Crystal Growth Morphology," in *Perspectives on Inorganic, Organic and Biological Crystal Growth: From Fundamentals to Applications*, M. Skowronski, J. DeYoreo, and C.A. Wang, editors, AIP Conference Proceedings **916** 176-190 (2007)
137. Etsuro Yokoyama, Robert F. Sekerka and Yoshonori Furukawa, "Growth of an Ice Disk :Dependence of critical thickness for disk instability on supercooling of water," J. Physical Chemistry **B113** 4733-4738 (2009).
138. Robert F. Sekerka, "Irreversible Thermodynamic Basis of Phase Field Models, Philosophical Magazine special issue *Phase Field Simulations: Materials Science Meets Biology and Medicine*, **91** 3-23 (2011).
139. Chang-You Lin, Michael Widom and Robert F. Sekerka, "Mean-field density functional theory of a three-phase contact line," Phys. Rev. **E85**, 011120-1-13 (2012)
140. Chang-You Lin, Michael Widom and Robert F. Sekerka, "Generalized potentials for a mean-field density functional theory of a three-phase contact line," Phys. Rev. **E88**, 012117-1-12 (2013)
141. Robert F. Sekerka, W.J. Boettinger and J.B. McFadden "Surface Morphologies due to Grooves at Moving Grain Boundaries having Stress-Driven Fluxes," Acta Materialia **61**, 7216-7226 (2013)
142. Y. Mishin, J. A. Warren, R. F. Sekerka and W. J. Boettinger, "Irreversible thermodynamics of creep in crystalline solids," Phys. Rev. **B88**, 184303-1-23 (2013)
143. R. F. Sekerka, S. R. Coriell, and G. B. McFadden, "Morphological Stability," in Nishinaga T, editor *Handbook of Crystal Growth*, Second edition, Vol. 1, Elsevier (2014) p. 595-630
144. Robert F. Sekerka, *Thermal Physics: Thermodynamics and Statistical Mechanics for Scientists and Engineers*, 610 pages, Elsevier, August 27, 2015. SBN-13: 978-0128033043 ISBN-10: 0128033045
145. Y. Mishin, G. B. McFadden, R. F. Sekerka and W. J. Boettinger, "Sharp interface model of creep deformation in crystalline solids," to appear in Phys. Rev. E

Publications in Progress

- R. F. Sekerka, W. J. Boettinger and G. B. McFadden, "Analytical proof of Sauer-Frieze formulae for ternary multicomponent diffusion couples"

OTHER PUBLICATIONS

- A D. R. Hamilton, J. D. Harrison, R. G. Seidensticker and R. F. Sekerka, "Effect of Interface Morphology on the Growth of Pure Ice," 1966 Saline Water Conversion Report, U. S. Dept. of the Interior, Office of Saline Water, p. 105.

- B** D. R. Hamilton, R. G. Seidensticker and R. F. Sekerka, “Factors Influencing Solute Segregation between Ice and Brine,” 1967 Saline Water Conversion Report, U. S. Dept. of the Interior, Office of Saline Water, p. 118.
- C** R. G. Seidensticker and R. F. Sekerka, “Solute Partitioning and Models for Crystal Growth,” 1968 Saline Water Conversion Report, U. S. Department of the Interior, Office of Saline Water, p. 180.
- D** R. F. Sekerka, “The Effect of Solidification Rate on Morphological Stability,” Proceedings of the Flat-Plate Solar Array Project Research Forum, “High-Speed Growth and Characterization of Crystals for Solar Cells,” U. S. Dept. of Energy & Jet Propulsion Laboratory, Port St. Lucie, Florida, July 1983.
- E** R. F. Sekerka, “On Liberal/Professional Education of, and by, Engineers and Scientists,” Carnegie Mellon Board of Trustees’ Meeting, Greenbriar, West Virginia, March 1983.
- F** Robert F. Sekerka, Robert A. Brown, Franklin D. Lemkey, William A. Sirignano, Thomas A. Steitz and John R. Carruthers, “Toward A. Microgravity Research Strategy, Space Studies Board, National Research Council, National Academy Press, Washington D.C. (1992).
- G** Robert F. Sekerka, “Solute Segregation and Morphological Stability, (Summer School on Crystal Growth, Palm Springs, CA 1992)
- H** Robert F. Sekerka, “Let’s not follow the dinosaurs,” Commencement address, Oregon Graduate Institute of Science and Technology, Beaverton, Oregon, June 1991
- I** Robert F. Sekerka, “The Role of Science and Technology in a Changing World,” Address on occasion of Doctor Honoris Casa, Universităţii de Vest din Timișoara, Romania, May 1996.
- J** Robert F. Sekerka, “WILLIAM WILSON MULLINS 1927-2001, A Biographical Memoir,” National Academy of Sciences, 2014
<http://www.nasonline.org/publications/biographical-memoirs/memoir-pdfs/mullins-william.pdf>
- K** Robert F. Sekerka, “Memories of Ichiro Sunagawa,” Journal of the Japanese Association for Crystal Growth, [Special Issue: The Memory of the Late Professor Ichiro Sunagawa] **41**, No. 1, 12-13 (2014)