

## **Peter W. Voorhees**

Department of Materials Science and Engineering  
Northwestern University  
Evanston, IL 60208  
(847) 491-7815

### **Experience**

Frank C. Engelhart Professor of Materials Science and Engineering, Department of Materials Science and Engineering, Northwestern University, Evanston, IL, 9/2000 - present  
Chair, Department of Materials Science and Engineering, Northwestern University, Evanston, IL, 9/2003 - 2011  
Professor, Department of Materials Science and Engineering, Northwestern University, Evanston, IL, 7/93 - 8/2000  
Associate Professor, Department of Materials Science and Engineering, Northwestern University, Evanston, IL, 1/88 - 6/93  
Metallurgist, Metallurgy Division, National Bureau of Standards, Gaithersburg, MD, 8/84 - 12/87  
National Research Council-National Academy of Sciences Postdoctoral Associate, Metallurgy Division, National Bureau of Standards, Gaithersburg, MD, 10/82 - 7/84  
Postdoctoral Research Fellow, Materials Engineering Department, Rensselaer Polytechnic Institute, Troy, New York., summer 1982.

### **Concurrent Positions**

Visiting Professor, Université de Montpellier II, Montpellier, France, 1995  
Visiting Scientist, Institut für Werkstofforschung, GKSS-Forschungszentrum Geesthacht, Germany, 1995  
Visiting Professor, Institut für Angewandte Physik, ETH Zürich, Switzerland, 1991  
Visiting Associate Professor, Groupe de Physique des Solides de L'Ecole Normale Supérieure, Université Paris VII, 1987  
Visiting Scientist, Institute for Theoretical Physics, University of California at Santa Barbara, Santa Barbara, CA, 1984  
Instructor, Materials Engineering Department, Rensselaer Polytechnic Institute, Troy, New York, 1980.

### **Education**

Doctor of Philosophy, Materials Engineering, Rensselaer Polytechnic Institute, Troy, New York, 1982  
Bachelor of Science, Physics, Rensselaer Polytechnic Institute, Troy, New York, 1977.

## **Honors and Awards**

TMS Bruce Chalmers Award, 2010.  
Fellow, American Physical Society, Materials Physics Division, 2005  
Highly Cited Researcher, Institute for Scientific Information, 2002  
Fellow, ASM International, 2001  
Frank C. Engelhart Professor of Materials Science and Engineering, 2000  
Materials Science and Engineering Teacher of the Year, 1999  
National Science Foundation Creativity Extension, 1999  
Outstanding Referee, Acta Materialia, 1998  
ASM International Materials Science Division Research Award (Silver Medal), 1992  
McCormick School of Engineering and Applied Science Award for Teaching Excellence, 1992  
Acta Metallurgica et Materialia Outstanding Paper Award, 1991  
Materials Science and Engineering Teacher of the Year, 1990  
Materials Science and Engineering Teacher of the Year, 1989  
National Science Foundation Presidential Young Investigator Award, 1989

## **Professional Activities**

### *Selected External Committees*

Co-Chair Physical Metallurgy Gordon Conference, 2011  
Chair, Applied Physical Sciences Panel of the Decadal Survey of Microgravity Life and Physical Sciences, National Research Council, 2009-2011.  
Chair, External Advisory Board, Center for Computational Materials Science, University of Illinois at Urbana Champaign 2005 – 2008.  
MRS Program Development Subcommittee 2005 - present  
External Advisory Board, Materials Science Research and Engineering Center, California Institute of Technology 2000 - 2010  
Chair, National Research Council Committee on Microgravity Research 2000 – 2003.  
External Advisory Board, Materials Science Research and Engineering Center Carnegie Mellon University 1996 - 1999  
Chair, Review Committee of the Caltech Accelerated Strategic Computing Initiative Center, 2001  
Universities Space Research Association, Microgravity Science Council 2000-2004  
National Research Council Space Studies Board 1998 – 2003.  
Executive Committee Space Studies Board 1998 - 2000.  
TMS Hardy Award Committee 1995- 1999  
TMS Matthewson Award Committee 1995- 1999  
Materials Research Society Awards Committee 1995-2000  
Materials Research Society Turnbull Awards Committee 1995-2000  
ASM Howe and Grossman Awards Committee 1995 - 1998  
National Science Foundation Special Emphasis Panel on Materials Theory 1998.  
NASA Microgravity Research Advisory Subcommittee 1998.  
Chair, NASA Materials Science Discipline Working Group 1998.

Chair, ASM Phase Transformations Committee, 1994-1997  
MRS Graduate Student Award Committee, 1995  
NASA Materials Science Discipline Working Group 1991-1998.  
Chair, TMS Solidification Committee, 1996-1998  
Defense Science Study Group 1991-1993.

*Consulting:*

Questek Innovations LLC, Intel, Idaho National Engineering Laboratory.

*Editorial Boards:*

Metallurgical Transactions A 1993-1996, J. Modeling and Simulation in Material Science 1993 - 2005.

**Plenary and Named Lectures**

*Coarsening in Solid-Liquid Mixtures: Results from the International Space Station*, International Symposium on Physical Sciences in Space, Bonn Germany, 7/11.

*The Evolution of Interfacial Morphology in Dendritic Solid-Liquid Mixtures*, International Conference on Solidification Processes, Aachen Germany, 6/11.

*Computations and Experiments in Four Dimensions*, Multiscale Material Modeling Conference, Freiburg Germany, 10/10.

*4D Measurements of Coarsening of Dendritic Solid-Liquid Mixtures*, Symposium on 3D/4D characterizations of microstructures, National Research Institute for Materials, Tsukuba, Japan 3/09.

*Results from the International Space Station: Coarsening in Solid-Liquid Mixtures*, Fifth International Conference on Solidification and Gravity, Miskolc-Lillafurd, Hungary, 9/08.

*Nanobio Research at Northwestern: From Materials for Regenerative Medicine to Nanowire Growth*, International Symposium on Emerging Materials for Nanobio Technology, Yonsei Yonsei University, Seoul Korea, 11/06.

*The Three-Dimensional Microstructure of Materials: From Fuel Cells to Dendrites*, Congress Brasileiro de Engenharia e Ciência dos Materiais, Foz do Igauçu, Brazil, 11/06.

*Coarsening of Dendritic Solid-Liquid Mixtures: Morphology and Dynamics*, Trivedi Symposium, Iowa State University, Ames IA, 9/06.

*The Need for Physical Science Research at NASA*, Testimony before the Subcommittee on Science and Space, U.S. Senate Commerce Committee 6/06.

*The Morphology of Multiphase Materials: Simulation and Experiment*, XIV International Materials Research Congress, Cancun Mexico, 8/05.

*The Three-Dimensional Microstructure of Materials, The Evolution of Topologically Complex Structures, Coarsening of Dendritic Microstructures*, Van Horn Lecture Series, Case Western Reserve University, Cleveland OH, 4/05.

*Materials Processing at the Nanoscale: From Quantum Dots to Nanowires*, Distinguished Lecture Series, Department of Materials Science and Engineering, Pennsylvania State University, State College, PA, 3/05.

*Computational Materials Science at the Nanoscale*, National Nanotechnology Initiative Grand Challenge Workshop on Nanomaterials, National Science Foundation, Arlington VA, 6/03.

*Coarsening in Solid-Liquid Mixtures*, Space Studies Board Meeting, National Academy of Sciences, Washington DC, 3/03.

*The Effects of Elastic Stress on the Evolution of Microstructure: Instabilities and Growth Laws 1 and 2*, NATO Advanced Study Institute on Thermodynamics, Microstructure and Plasticity Frejus, France 9/02.

*Coarsening of Solid-Liquid Mixtures: Morphology and Kinetics*, Merton C. Flemings Symposium, Cambridge, MA 6/00.

*Morphological Evolution in Elastically Stressed Solids: From Equilibrium to Dynamics*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA 5/97.

## **Affiliations**

ASM International

The Metals, Minerals and Materials Society

American Association for the Advancement of Science

Materials Research Society

American Physical Society

## **Book**

*Growth and Coarsening: Ostwald Ripening in Materials Processing*, L. Ratke and P.W. Voorhees, Springer-Verlag 2002.

## Technical Presentations 1996 - Present

1. *The Stability of Heteroepitaxial Thin Films*, The Institute for Mathematics and Its Applications, University of Minnesota, Minneapolis, MN 2/96.\*
2. *The Chemical and Morphological Stability of Lattice-Mismatched Films*, TMS Annual Meeting, Anaheim, CA 2/96.\*
3. *Surface Ripples and Composition Fluctuations: Are they related?*, Materials Science Symposium, Sandia National Laboratories, Albuquerque, NM 3/96.\*
4. *The Stability of Heteroepitaxial Thin Films*, MRS Spring Meeting, San Francisco, CA 4/96.\*
5. *Ostwald Ripening in Two-Phase Mixtures*, Sixth Conference on Computational Research in Materials, Morgantown, WV 5/96.\*
6. *Coarsening in Solid-Liquid Mixtures*, NASA Microgravity, Materials Science Conference, Huntsville AL 6/96.\*
7. *Stability of Solid Films: Dewetting*, SIAM Annual Meeting, Kansas City, MO 7/96.\*
8. *The Effects of Strain on the Evolution of Interfaces*, The Dynamics of Crystal Surfaces and Interfaces, Traverse City, MI 8/96.\*
9. *Ostwald Ripening in the Presence of Deformation: Particle Morphology and Kinetics Research*, Workshop on Interfacial Stress Center for Nonlinear Analysis, Carnegie-Mellon University, Pittsburgh, PA 7/96.\*
10. *The Effects of Elastic Stress on Diffusion in Crystalline Solids*, TMS Fall meeting, Cincinnati, OH 10/96.\*
11. *The Morphology of Misfitting Precipitates: Equilibrium Shapes and Evolution*, TMS Fall meeting, Cincinnati, OH 10/96.\*
12. *Surface Ripples and Composition Fluctuations: A New Instability in Epitaxial Films Condensed Matter*, Colloquium, Notre Dame University, South Bend, IN 11/96.\*
13. *The Space Shuttle as a Laboratory to Study Coarsening Materials*, Science Club Seminar, Northwestern University, Evanston, IL 2/97.
14. *Morphological Evolution in Elastically Stressed Solids: From Equilibrium to Dynamics*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA 5/97. (Plenary)

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15. *Evolution of High Volume Fraction Solid-Liquid Mixtures During Coarsening*, Conference on Dynamics of Mixed Phase Regions, International Centre for Mathematical Sciences, Edinburgh, Scotland 6/97.\*
16. *Ostwald Ripening*, Workshop on Mathematical Models Involving Phase Change: Dynamics of Mixed Phase Regions International Centre for Mathematical Sciences, Edinburgh, Scotland 6/97.\*
17. *Discussion leader on Phase Field Models: A Neutral Observers Opinion*, Workshop on Mathematical Models Involving Phase Change: Dynamics of Mixed Phase Regions, International Centre for Mathematical Sciences, Edinburgh, Scotland 6/97.\*
18. *Towards a First Principles Prediction of Coarsening Kinetics in Ni-based Super alloys*, Materials Science and Metallurgy Department, Cambridge University, Cambridge, England 6/97\*
19. *The Microstructure of High Volume Fraction Solid-Liquid Mixtures*, TMS Fall meeting, Indianapolis, IN 9/97.\*
20. *The Morphological Stability of Alloy Thin Films*, TMS Fall meeting, Indianapolis, IN 9/97.\*
21. *Ostwald Ripening in Elastically Stressed Solids*, TMS Fall meeting, Indianapolis, IN 9/97.\*
22. *The Trials and Tribulations of MSL-1 and MSL-1R: Materials Science on Board the Space Shuttle*, Materials Science Club Seminar, Northwestern University, Evanston, IL 11/97.
23. *Ostwald Ripening in Elastically Stressed Solids*, Fall MRS Meeting, Boston, MA 12/97.\*
24. *Heteroepitaxy: The Effects of Elastic Stress on Surface Stability*, Condensed Matter Seminar, University of Missouri, Columbia, MO 1/98.\*
25. *Morphological Evolution of Alloy Strained Layers*, Department of Materials Science and Engineering, Colloquium, University of Michigan, Ann Arbor, MI 2/98.\*
26. *Numerical Simulation of Ostwald Ripening in Elastically Stressed Solids*, Department of Mechanical and Materials Engineering, Louisiana State University, Baton Rouge, LA 4/98.\*
27. *Ostwald Ripening in the Presence of Elastic Stress: Self-Similarity, Kinetics and Anisotropy*, The 79th Statistical Mechanics Conference, Rutgers, NJ 5/98.\*
28. *Computer Simulation of Ostwald Ripening in Elastically Stressed Solids*, CIMTEC, Symposium on Computational Materials Science, Florence, Italy 6/98.

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29. *Coarsening in Solid-Liquid Mixtures* 1998 Microgravity, Materials Science Conference, Huntsville, AL 7/98.\*
30. *The Interaction of Stress, Composition, and Morphology During Heteroepitaxy*, Workshop on Highly Strained Semiconductors: Narrow Bandgap Materials and Nanostructures, Northwestern University, Evanston, IL 9/98.
31. *Coarsening in Solid-Liquid Mixtures: A Comparison Between Theory and Experiment*, MRS Fall Meeting, Boston, MA 12/98.\*
32. *Morphological Stability of Alloy Thin Films*, Nonlinear Science Seminar, Evanston, IL 1/99.\*
33. *The Thermodynamics of Interfaces Far From Equilibrium*, TMS Annual Meeting, San Diego, CA 3/99.\*
34. *Ostwald Ripening of Two-Phase Mixtures: A Test of Theory*, TMS Annual Meeting, San Diego, CA 3/99.\*
35. *Morphological Evolution of Strained Alloy Thin Films*, MRS Spring Meeting, San Francisco, CA 4/99.\*
36. *A Personal View of the Joys and Sorrows of Performing Experiments Onboard the Space Shuttle*, NU-Club of Cleveland and ASM Cleveland Chapter Meeting, Cleveland, OH 5/99\*
37. *Challenges and Opportunities for Microgravity*, Materials Science Research on the Space Station: A Personal Perspective Universities Space Research Association, Microgravity Council Meeting, Washington, DC 5/99.\*
38. *The Dynamics of Ostwald Ripening*, International Conference on Solid-Solid Phase Transformations '99, Kyoto, Japan 5/99.\*
39. *Coarsening in Elastically Stressed Systems: Scaling, Kinetics, and Microstructural Development*, Focus Group Session, International Conference on Solid-Solid Phase Transformations '99, Kyoto, Japan 5/99.\*
40. *Phase Field Models: An Outsiders Perspective*, Focus Group Session, International Conference on Solid-Solid Phase Transformations '99, Kyoto, Japan 5/99.\*
41. *The Dynamics of Late-Stage Phase Separation: A Test of Theory Gravitational Effects in Physico-Chemical Systems*, Gordon Conference, New England College, Henniker, NH 6/99.\*
42. *Morphological evolution of Films during Heteroepitaxy*, Interfaces for the Twenty-first Century, Monterey, CA 8/99\*.

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43. *Morphological Stability of Rods in the Presence of Surface Energy and Elastic Stress*, TMS Fall Meeting, Cincinnati, OH 10/99.\*
44. *The Dynamics of Ostwald Ripening in Elastically Stressed Solids*, MRS Fall meeting, Boston, MA 12/99.\*
45. *Precipitate Coarsening in Elastically Stressed Solids*, Microstructure Days, Brown University Providence, RI 2/99.\*
46. *NASA in the Age of Faster, Cheaper, Better*, NU Club of Naples, Naples, FL 1/00.\*
47. *Morphological Evolution of Thin Films with Highly Anisotropic Surface Energy*, Applied Mathematics Symposium California Institute of Technology, Pasadena, CA 1/00.\*
48. *A Fast Multipole Method for Anisotropic Elasticity*, Number Crunch Lunch Applied Mathematics, Northwestern University, Evanston, IL 2/00.\*
49. *Late-Stage Phase Separation in Elastically Stressed Solids*, TMS Annual Meeting, Nashville, TN 3/00.\*
50. *The Evolution of Thin Films During Heteroepitaxy: From Planar Films to Dots* Spring, MRS meeting, San Francisco, CA 4/00.\*
51. *Transient Ostwald Ripening: A Comparison Between Theory and Experiment*, SIAM Conference on the Mathematical Aspects of Materials Science, Philadelphia, PA 5/00.\*
52. *The Evolution of Elastically Stressed Films with Highly Anisotropic Surface Energy*, SIAM Conference on the Mathematical Aspects of Materials Science, Philadelphia, PA 5/00.\*
53. *Coarsening in Solid-Liquid Mixtures*, Microgravity Materials Science Conference, Huntsville, AL 6/00
54. *Coarsening of Solid-Liquid Mixtures: Morphology and Kinetics*, Merton C. Flemings Symposium, Cambridge, MA 6/00. (Keynote address)
55. *Computational Materials Science at the Mesoscale: From Super alloys to Thin Films*, Physical Metallurgy, Gordon Conference, Holderness, NH 7/00.\*
56. *A Phase Field Model for Systems With Highly Anisotropic Surface Energy*, MRS Fall Meeting, Boston, MA 11/00.\*
57. *The Dynamics of Ostwald Ripening in Elastically Stressed Solids*, Aerospace Engineering and Mechanics Dept., University of Minnesota – Twin Cities, 12/00.\*

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58. *The Dynamics of Late-Stage Phase Separation in Elastically Stressed Solids*”, Workshop on Computational Aspects of Materials Science, Argonne National Laboratory, Argonne IL, 1/01.\*
59. *The Dynamics of Ostwald Ripening in Elastically Stressed Solids*, Laboratoire d'Etude des Microstructures, ONERA, Chatillon, France 3/01.\*
60. *The Dynamics of Ostwald Ripening in Elastically Stressed Solids*, Service de Recherches de Metallurgie Physique, CEA, Gif-sur-Yvette France 3/01.\*
61. *The Morphological Evolution of Thin Films and the Formation of Quantum Dots*, Society for Engineering Science Conference, San Diego CA 6/01.\*
62. *Coarsening in Solid-Liquid Mixtures*, International Space Station Utilization Conference, Cocoa Beach FL, 10/01.\*
63. *The Morphological Evolution of Dendritic Microstructures during Coarsening*, TMS Fall Meeting, Indianapolis IN, 11/01.\*
64. *The Morphological Evolution of Thin Films with Anisotropic Surface Energy*, Interphase 2001, 9<sup>th</sup> International Workshop on Numerical Methods for Free Boundary Problems, U. Maryland College Park, 1/02.\*
65. *Ostwald Ripening in Elastically Stressed Solids: The Effect of Interparticle Coalescence*, TMS-Annual Meeting, Seattle WA, 2/02.\*
66. *The Dynamics of Quantum Dot Formation During Heteroepitaxy*. American Physical Society March meeting, Indianapolis IN, 3/02.\*
67. *Nanoscale Modeling of Quantum Dot Formation During Heteroepitaxy*, 10<sup>th</sup> International Ceramics Congress and 3<sup>rd</sup> Forum on New Materials, CIMTC, Florence Italy, 6/02.\*
68. *The Evolution of Thin Films During Heteroepitaxy: Morphological Instability and Quantum Dot Formation*, Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle WA, 8/02.\*
69. *The Effects of Elastic Stress on the Evolution of Microstructure: Instabilities and Growth Laws 1 and 2*, NATO Advanced Study Institute on Thermodynamics, Microstructure and Plasticity Frejus, France 9/02.\*
70. *From Dendrites to Superalloys: New Views of Microstructural Evolution Using Three Dimensional Reconstructions*, TMS Fall Meeting, Columbus OH. 10/02.\*

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71. *New Views of Microstructural Evolution Using Three Dimensional Reconstructions: Coarsening in Topologically Complex Systems*, Department of Materials Science and Engineering Colloquium, Carnegie Mellon University, Pittsburgh PA, 1/03.\*
72. *Coarsening in Topologically Complex Two-Phase Mixtures*, Applied Mathematics Colloquium, Northwestern University, Evanston IL, 2/03.\*
73. *Coarsening in Topologically Complex Two-Phase Mixtures*, Department of Mechanical Engineering Colloquium, Yale University, New Haven CT, 2/03.\*
74. *Coarsening in Elastically Stressed Solids: Large Scale Simulations and Three Dimensional Reconstructions*, Brockhouse Institute for Materials Research, McMaster University, Hamilton Ontario, Canada 2/03.\*
75. *The Dynamics of Interfacial Evolution in Three Dimensions: Coarsening of Dendritic Microstructures*, TMS Annual meeting, San Diego CA, 3/03.
76. *Three Dimensional Evolution of Topologically Complex Structures During Coarsening*, TMS Annual meeting, San Diego CA, 3/03.\*
77. *Coarsening in Solid-Liquid Mixtures*, Space Studies Board Meeting, National Academy of Sciences, Washington DC, 3/03.\*
78. *Computational Materials Science of Micro-and Nanostructures*, Northwestern Computational Science meeting, Evanston IL, 3/03.\*
79. *Coarsening of Topologically Complex Two-Phase Mixtures*, Sekerka Symposium, Carnegie Mellon University, Pittsburgh PA, 4/03.\*
80. *Phase Field Methods: Development*, Lawrence-Livermore Computational Materials Science Summer School, Livermore CA, 7/03.\*
81. *Phase Field Methods: Applications*, Lawrence-Livermore Computational Materials Science Summer School, Livermore CA, 7/03.\*
82. *The Evolution of Topologically Complex Structures During Coarsening*, Applied Mathematics Symposium, University of California and Irvine, Irvine CA, 10/03.\*
83. *The Evolution and Self Assembly of Quantum Dots*, Northwestern-Argonne Nanotechnology Symposium, Northwestern University, Evanston, IL, 10/03.\*

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84. *Evolution and Self-Assembly of Quantum Dots on Surfaces*, Workshop on Nonequilibrium Interface Dynamics: Theory and Simulation from Atomistic to Continuum Scales, Center for Scientific Computation and Mathematical Modeling, University of Maryland, 10/03.\*
85. *Simulations and Experiments of Coarsening in Dendritic Solid-Liquid Mixtures*, TMS-Fall meeting, Chicago IL, 11/03.\*
86. *The Morphology of Misfitting Islands: Volmer Webber Growth*, MRS – Fall meeting, Boston MA, 12/03.
87. *The Evolution and Self Assembly of Quantum Dots on Surfaces*, Joint University of Toledo-Bowling Green State University Physics Colloquium, 1/04.\*
88. *Coarsening in Solid-Liquid Mixtures: A Comparison Between Theory and Experiment*, Geology Colloquium, Northwestern University, Evanston IL 2/04.\*
89. *Topological Complexity and the Dynamic of Coarsening: New Insights via Three-Dimensional Reconstructions*, Materials Laboratory, Wright Patterson Air Force Base, Dayton OH, 2/04.\*
90. *The Evolution and Self Assembly of Quantum Dots on Surfaces*, Dept. of Materials Science and Engineering, Arizona State University, Tempe AZ, 3/04.\*
91. *Coarsening of Dendritic Microstructures*, Wilfried Kurz Symposium, TMS Annual meeting Charlotte NC 3/04.
92. *Phase Field Simulations of Coarsening in Three Dimensional Topologically Complex Structures*, TMS Annual meeting Charlotte NC 3/04.\*
93. *The Evolution and Directed Self Assembly of Quantum Dots on Surfaces*, SIAM Conference on the Mathematical Aspects of Materials Science, Los Angeles CA, 4/04.\*
94. *Coarsening in Topologically Complex Systems: Experiments and Simulations*, SIAM Conference on the Mathematical Aspects of Materials Science, Los Angeles CA, 4/04.\*
95. *Nanowire Formation: Interfacial Morphology and Growth Kinetics*, Nineteenth Conference on Crystal Growth and Epitaxy, Stanford Camp CA, 5/04.\*
96. *Using Three-Dimensional Reconstructions to Characterize Coarsening in Topologically Complex Systems*, TMS Fall meeting, New Orleans LA, 9/04.\*
97. *Materials Processing at the Nanoscale: Nanowire Formation by the Vapor-Liquid-Solid Process*, Materials Science and Engineering Department Colloquium, Johns Hopkins University, Baltimore MD, 11/04.\*

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98. *Coarsening in Topologically Complex Structures: Experiment and Theory*, Materials Science and Engineering Department Colloquium, Iowa State University, Ames IA, 10/04.\*
99. *The Effects of Elastic Stress on the Evolution of Interfaces*, The Hillert Symposium, KTH, Stockholm Sweden, 12/04.\*
100. *The Morphology and Self Assembly of Quantum Dots: Surface Reconstructions and Nonlinear Development*, Department of Physics, University of Houston, Houston TX, 2/05.\*
101. *The Morphology and Self Assembly of Quantum Dots on Surfaces*, TMS Annual Meeting, San Francisco CA, 2/05.\*
102. *Nanowire Formation Interfacial Morphology and Growth Kinetics*, TMS Annual Meeting, San Francisco CA, 2/05.\*
103. *Coarsening of Dendritic Microstructures*, TMS Annual Meeting, San Francisco CA, 2/05.\*
104. *Microgravity Research: A Retrospective of Accomplishments*, American Physical Society Meeting, Los Angeles CA, 3/05.\*
105. *Materials Processing at the Nanoscale: From Quantum Dots to Nanowires*, Department of Materials Science and Engineering, Pennsylvania State University, State College, PA, 3/05.\*
106. *The Three-Dimensional Microstructure of Materials, The Evolution of Topologically Complex Structures, Coarsening of Dendritic Microstructures*, Van Horn Lecture Series, Case Western Reserve University, Cleveland OH, 4/05.\*
107. *The Topology of Interfaces in Systems Undergoing Coarsening*, SIAM Conference on Non Linear Dynamics, Snowbird UT, 5/05.\*
108. *Coarsening in Topologically Complex Systems*, Solid-Solid Phase Transformations in Inorganic Materials 21005, Phoenix AZ, 6/05.\*
109. *Three-Dimensional Phase Field Simulations and Microstructural Reconstructions of Systems Undergoing Coarsening*, Microscopy and Microanalysis, Honolulu HI, 8/05.\*
110. *The Three-Dimensional Microstructure of Materials: Measurement and Analysis*, Microscopy and Microanalysis, Honolulu HI, 8/05.\*
111. *The Morphology of Multiphase Materials: Simulation and Experiment*, XIV International Materials Research Congress, Cancun Mexico, 8/05 (plenary).
112. *Coarsening of Dendritic Microstructures: Topology and Topological Singularities*, XIV International Materials Research Congress, Cancun Mexico, 8/05.\*

113. *Multiscale Modeling of Quantum Dot Formation on Surfaces*, Multiscale Modeling in Condensed Matter and Materials Science, Institute for Pure and Applied Mathematics, UCLA 10/06.\*
114. *Coarsening of Topologically Complex Systems: Experiments and Simulations*, Computational Homology and Materials Science Workshop, Georgia Tech, Atlanta GA, 2/06.\*
115. *Phase Field Simulations of Microstructural Development: Topology and Topological Singularities*, TMS Annual meeting, San Antonio TX, 3/06.\*
116. *The Three-Dimensional Microstructure of Materials*, TMS Annual meeting, San Antonio TX, 3/06.
117. *The Morphology of Interfaces in Materials: From Spinodal Decomposition to Fuel Cells*, Princeton Institute for the Science and Technology of Materials, Princeton University, Princeton NJ 4/06\*.
118. *The Three-Dimensional Microstructure of Materials: Simulation and Experiment*, Department of Materials Science and Engineering Colloquium, The Ohio State University, Columbus OH 4/06.\*
119. *Research at NASA*, Testimony before the Senate Commerce and Transportation Subcommittee, 6/06.\*
120. *The Three-Dimensional Microstructure of Materials: From Mushy Zones to Solid-Oxide Fuel Cells*, Thermec'05, Vancouver British Columbia, Canada 7/06.\*
121. *Spinodal Decomposition in Three Dimensions: Morphology and Topology*. Metallurgy Division, National Institute for Standards and Technology, Gaithersburg MD 8/06.\*
122. *Coarsening of Dendritic Solid-Liquid Mixtures: Morphology and Dynamics*, Trivedi Symposium, Iowa State University, Ames IA, 9/06 (keynote).
123. *An Investigation of Defects Associated with Solidification of Superalloys used in the Aerospace Industry*, MS&T meeting, Cincinnati OH, 10/06.\*
124. *Interfaces in Materials: From Phase Separation to Fuel Cells*, Materials Science and Engineering Colloquium, Cornell University, Ithaca NY, 11/06.\*
125. *The Three-Dimensional Microstructure of Materials: From Fuel Cells to Dendrites*, Congress Brasileiro de Engenharia e Ciência dos Materiais, Foz do Igauçu, Brazil 11/06 (plenary).

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126. *Nanobio Research at Northwestern: From Materials for Regenerative Medicine to Nanowire Growth*, International Symposium on Emerging Materials for Nanobio Technology, Yonsei University, Seoul Korea, 11/06 (keynote).
127. *Evolution of Bicontinuous Interfaces during Coarsening*, MRS Fall meeting, Boston MA, 12/06.\*
128. *Phase Field Methods: Fundamentals and Applications*, D3D Workshop on Phase Field Methods, Alexandria VA, 12/06.\*
129. *Coarsening in Morphologically Complex Systems following Spinodal Decomposition*, TMS Annual Meeting, Orlando FL, 3/07.\*
130. *Semiconductor Nanowires: Growth and Morphology*, Department of Materials Science and Engineering, University of Michigan, Ann Arbor MI, 3/07.\*
131. *The Morphology and Topology of Interfaces: From Phase Separation to Fuel Cells*, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN 4/07\*.
132. *The Three-Dimensional Microstructure of Materials: Measurement and Analysis*, Microscopy and Microanalysis meeting, Ft. Lauderdale FL, 8/07\*.
133. *Phase Field Methods: Fundamentals and Applications, Lecture I and II*, Metal Structures in 4D Summer School, Gudhjem Denmark 8/07.\*
134. *Grain Growth in Three Dimensions: Theory and Experiment*, TMS-Fall meeting, Detroit MI, 9/07.\*
135. *The Growth and Morphology of Semiconductor Nanowires*, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana IL 10/07\*.
136. *The Growth of Nanowires and Quantum Dots: Morphology and Thermodynamics*, Maths Department, University of Glasgow, Scotland 11/07\*.
137. *A Phase Field Model of Thin Film Growth Under Stress*, APCOM '07 – EPMESC IX, Kyoto Japan, 12/07\*.
138. *Topology and Morphology of Interfaces: From Phase Separation to Grain Growth*. Metallo-07, Kanpur India, 12/07\*.
139. *Coarsening in Solid-Liquid Mixtures II: Past results and Future Plans*, American Aeronautics and Astronautics meeting, Reno NV 1/08.\*
140. *Simulating Grain Growth in Three Dimensions*, TMS Annual Meeting, New Orleans LA 3/08.\*

141. *Evolution of Interfaces During Coarsening: Topology and Morphology*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia PA 5/08.\*
142. *Phase Equilibrium and Nanowire Growth*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia PA 5/08.\*
143. *The Dynamics of Heteroepitaxy via Lattice Phase Field Computations*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia PA 5/08.\*
144. *Simulation of Anisotropic Grain Growth in Three Dimensions*, International Conference on Texture of Materials, Pittsburgh PA, 6/08.\*
145. *Microgravity Life and Physical Sciences*, Space and Earth Science: 50 Years and Counting, The National Academies, National Academy of Sciences, Washington D.C. 6/08.\*
146. *Thermodynamics and Kinetics of Transformations at the Nanoscale*. Lecture series, Yonsei University, Seoul Korea, 7/08.\*
147. *Results from the International Space Station: Coarsening in Solid-Liquid Mixtures*, Fifth International Conference on Solidification and Gravity, Miskolc-Lillafurd, Hungary, 9/08\*
148. *Strengthening the Processing-Structure-Properties Link: Using 3D-Reconstructions in Simulations*, Advanced Image Segmentation in Materials Science, Carnegie Mellon University, Pittsburgh, PA 11/08.\*
149. *The Topology and Morphology of Bicontinuous Interfaces*, Department of Physics, University of Toronto, Toronto Canada 11/08.\*
150. *Phase Field Crystal Models for the Evolution of Interfaces in Materials*, Department of Applied Mathematics, Illinois Institute of Technology, 11/08\*.
151. *Step Flow Growth of a Nanowire via the Vapor-Liquid-Solid and Vapor-Solid-Solid Mechanisms*, MRS Fall Meeting, Boston MA, 12.08.
152. *Phase Field Crystal Simulations and the Self Assembly of Quantum Dots on Surfaces*, Department of Materials Science and Engineering, University of Delaware, Newark Delaware, 12/08.\*
153. *Coarsening in Solid-Liquid Mixtures II: ISS Results*, American Institute for Aeronautics and Astronautics meeting, Orlando FL, 1/09.\*
154. *The Three-Dimensional Morphology and Topology of Dendritic Mushes*, Dept. Applied Mathematics and Theoretical Physics, University of Cambridge, Cambridge UK. 2/09.\*

155. *Using Experimental Data in Simulations of Grain Growth*, TMS Annual meeting, San Francisco CA 2/09.\*
156. *Insitu Observations of Coarsening of Dendritic Solid-Liquid Mixtures*, TMS Annual meeting, San Francisco CA 2/09.\*
157. *The Topology and Morphology of Three-Dimensional Bicontinuous Mixtures*, TMS Annual meeting, San Francisco CA 2/09.\*
158. *3D Visualization of Materials Structure: From Grains to Nanowires*, International Young Investigators Symposium, National Research Institute for Materials, Tsukuba, Japan 3/09.\*
159. *4D Measurements of Coarsening of Dendritic Solid-Liquid Mixtures*, Symposium on 3D/4D characterizations of microstructures, National Research Institute for Materials, Tsukuba, Japan 3/09.\*
160. *The Topology and Morphology of Bicontinuous Interfaces*, Department of Mathematics, Brown University 4/09.\*
161. *The Growth of VLS Nanowires from Atoms to Wires*, Laboratoire de Physique de la Matière Condensée, Ecole Polytechnique, France 7/09.\*
162. *Phase Field Crystal Simulations of Grain Growth and Interfacial Evolution*, Workshop on applications of classical density functional theory in soft and hard matter, CECAM, Lausanne Switzerland, 10/09.\*
163. *Interfacial Motion at the Nanoscale: Grain Growth in Nanocrystalline Materials*, Physics Department Colloquium, Wayne State University, Detroit MI 1/10.\*
164. *Phase Field Crystals: Atomistic Simulations on Diffusive Timescales*, TMS Annual Meeting, Seattle WA, 2/10.\*
165. *Phase Field Crystal Simulations of Nanostructure Formation*, NIST Diffusion Workshop, 3/10.
166. *Modeling Grain Growth of Nanocrystalline Materials*, Computers Materials Continua Conference, Las Vegas NV, 3/10.\*
167. *Interfacial Motion at the Nanoscale; from grain growth to nanowires*, Materials Science and Engineering Colloquium, Rensselaer Polytechnic Institute, Troy NY 4/10.\*
168. *Self-Similarity During Coarsening of Topologically Complex Mixtures*, SIAM Meeting on Mathematical Methods in Materials Science, Philadelphia PA, 6/10.\*



169. *Universal Morphologies Near Topological Singularities*, SIAM Meeting on Mathematical Methods in Materials Science, Philadelphia PA, 6/10.\*
170. *Universality and topological singularities in materials: Self-Similar Pinch-Off of Rods*, Phase Transformations in Materials '10, Avignon France, 6/10.\*
171. *Droplet Dynamics During Vapor-Liquid-Solid Growth*, Whiskers, Wires and Walls workshop, National Institute for Standards and Technology, Gaithersburg MD 9/10.\*
172. *Grain Growth at the Nanoscale Using the Phase Field Crystal Method*, RISO Laboratory for Energy and Sustainability, Roskilde Denmark, 8/10.\*
173. *Computations and Experiments in Four Dimensions*, Materials Science and Engineering Colloquium, University of California Berkeley, Berkeley CA 10/10.\*
174. *Computations and Experiments in Four Dimensions: From Grains to Singularities*, Department of Materials Science and Engineering Colloquium, Purdue University, West Lafayette IN, 12/10.\*
175. *The Dynamics of Liquid Drops During Vapor-Liquid-Solid Nanowire Growth*, Materials Science and Engineering Colloquium, North Carolina State University, Raleigh NC, 4/11\*.
176. *Interfacial Motion at the Nanoscale: Grain Growth, Nanowires and Quantum Dots*, Electron Microscopy and Multiscale Modeling, Lake Tahoe CA 4/11.\*
177. *Microgravity Life and Physical Sciences Decadal Study*, European Science Foundation, Strasbourg, France 6/11.\*
178. *The Dynamics of Liquid Drops During Vapor-Liquid-Solid Nanowire Growth*, ICMAT 20011, Singapore 6/11.\*
179. *Pattern Formation and Atomic Scale Processes in Crystals*, PIRE and OxMos Workshop, Oxford, UK 9/11.\*

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\* Invited

## Publications

1. M.E. Glicksman, P.W. Voorhees, and R.S. Setzko, *The Triple Point Equilibria of Succinonitrile: Its Assessment as a Temperature Standard*, Proceedings of the Sixth International Conference on Temperature, **5**, 321 (1982).
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13. P.W. Voorhees, *The Theory of Ostwald Ripening*, J. Stat. Phys., **38**, 231, (1985).
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15. P.W. Voorhees and W.C. Johnson, *Interfacial Equilibrium During a First-Order Phase Transformation in Solids*, J. Chem. Phys., **84**, 5108, (1986).
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17. S.R. Coriell, G.B. McFadden, P.W. Voorhees, and R.F. Sekerka, *Stability of a Planar Interface During Solidification of a Multicomponent System*, J. Crystal Growth, **82**, 295, (1987).
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