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Experience

Co-Director, Northwestern University-Argonne National Laboratory Institute of Science and Engineering, 9/2012 – present.
Co-Director, Center for Hierarchical Materials Design, 1/2014– present.
Frank C. Engelhart Professor of Materials Science and Engineering, Department of Materials Science and Engineering, Northwestern University, Evanston, IL, 9/2000 – present.
Professor, Engineering Sciences and Applied Mathematics, Northwestern University, Evanston IL, 9/2005– present.
Chair, Department of Materials Science and Engineering, Northwestern University, Evanston, IL, 9/2003 – 9/2011.
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 Fellow Commoner, Trinity College, Cambridge, United Kingdom 2015
Visiting Professor, Université Pierre et Marie Curie Paris 6, France, 2014
Visiting Professor, Laboratoire de Physique de la Matière Condensée, Ecole Polytechnic, France 2008
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

Moore Distinguished Scholar, California Institute of Technology, 2018

Member, American Academy of Arts & Sciences, 2016

Fellow, The Minerals, Metals and Materials Society, 2013

J. Willard Gibbs Phase Equilibria Award ASM International, 2013

Bruce Chalmers Award, The Minerals, Metals and Materials Society, 2010

Fellow, American Physical Society, Materials Physics Division, 2005

Highly Cited Researcher, Materials Science, Institute for Scientific Information, 2002

Fellow, ASM International, 2001

Frank C. Engelhart Professor of Materials Science and Engineering, 2000

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, 1989, 2011

National Science Foundation Presidential Young Investigator Award, 1989

Professional Activities

Selected External Committees

New Hampshire BioMade Scientific Advisory Board, 2018-present

Organizing Committee, 4th International Congress on 3D Materials Science

Organizing Committee, International Conference on Advances in Solidification

NSF-Center for Bright Beams External Advisory Board, 2017 – present

Materials and Chemistry Review Committee, Argonne National Laboratory, 2018

Member, International Advisory Board for the structural materials for innovation program, Cabinet Office, Government of Japan, 2014 - present

Co-Chair, NSF Workshop “Building a Civil, Mechanical and Manufacturing Innovation Data Infrastructure Community,” 2017.

National Academies Committee on Biology and Physical Sciences in Space, 2014 - present

Chair, TMS Multiscale Modeling Roadmapping Study, 2014.

Advanced Photon Source-Photon Sciences Directorate Review Board, 2014 – 2017.

National Science Foundation Mathematics and Physical Sciences Subcommittee on Materials Instrumentation, 2013-2014.
International Space Station Standing Review Board, 2013
Co-Chair Physical Metallurgy Gordon Conference, 2011
Chair, National Academy Applied Physical Sciences Panel of the Decadal Survey of Microgravity Life and Physical Sciences, 2009-2011.
Chair, External Advisory Board, Center for Computational Materials Science, University of Illinois at Urbana Champaign 2005 – 2008.
Material Research Society Program Development Subcommittee 2005 - 2014
External Advisory Board, Materials Science Research and Engineering Center, California Institute of Technology 2000 - 2010
Chair, National Academy Committee on Microgravity Research, 2000 – 2003.
External Advisory Board, Materials Science Research and Engineering Center Carnegie Mellon University 1996 – 1999
Materials Science and Engineering Departmental visiting committees: Johns Hopkins University (2009-present), University of Florida (2011), Iowa State University (2008, 2010), Rensselaer Polytechnic Institute, and University of Texas Dallas
Chair, Review Committee of the Caltech Accelerated Strategic Computing Initiative Center, 2001
Universities Space Research Association, Microgravity Science Council 2000-2004
National Academy 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:

Apple, Dow-Corning, 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

Solidification in 4D: from Dendrites to Eutectics and Microstructure, Institute Lecture, Indian Institute of Technology Bombay, 3/18.

Microstructural Evolution in Materials, Advanced Photon Source Users Meeting, Argonne IL, 6/17.

Solidification in 4D: from Dendrites to Eutectics, The 10th Thailand International Metallurgy Conference, Bangkok, Thailand 3/17.

The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative, National Institute for Materials Science, NIMS-Week, 10/16.

The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative, Opening Ceremony of the Research Center for the Computational Design of Advanced Functional Materials, National Institute for Advanced Industrial Science and Technology, Japan 2/16.

Watching Microstructure Evolve in Three Dimensions, Van Vlack Lectures, Department of Materials Science and Engineering, University of Michigan, 10/15.

Quantum Dot Formation on Nanowires, YUCOMAT 2015, Montenegro, 9/15.

Coarsening of Two-Phase Mixtures: From Particles to Bicontinuous Phases, Hillert-Cahn Lecture, International Conference on Solid-Solid Phase Transformations, Whistler, Canada 8/15.

Computational Materials Science and the Materials Genome Initiative, International Conference for Young Researchers on Advanced Materials, Haikou China 10/14.

4D Measurements of Microstructural Evolution, 2nd International Congress on 3D Materials Science, Ancy France 6/14.

The Role of Capillarity during Phase Transformations, J. Williard Gibbs Phase Equilibria Award Lecture, MS&T meeting, Montreal Canada, 11/13.

Computational Materials Science: From Atoms to Engine Blocks, D.K.C. MacDonald Memorial Lecture, Canadian Materials Science Conference, Montreal Canada, 6/13.

4D Evolution of Interfaces in Materials, 5th International Symposium on Designing, Processing and Properties of Advanced Engineering Materials, Toyohashi Japan, 10/12.

4D Evolution of Microstructure, M.E. Fine lecture, Department of Materials Science and Engineering, Northwestern University 10/12.

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 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.

Patent

3D Material Analysis, US patent # 20020081015 A1 (2000)

Technical Presentations 2010 - Present

1. *Interfacial Motion at the Nanoscale: Grain Growth in Nanocrystalline Materials*, Physics Department Colloquium, Wayne State University, Detroit MI 1/10 (invited).
2. *Phase Field Crystals: Atomistic Simulations on Diffusive Timescales*, TMS Annual Meeting, Seattle WA, 2/10 (invited).
3. *Phase Field Crystal Simulations of Nanostructure Formation*, NIST Diffusion Workshop, 3/10.
4. *Modeling Grain Growth of Nanocrystalline Materials*, Computers Materials Continua Conference, Las Vegas NV, 3/10 (invited).
5. *Interfacial Motion at the Nanoscale; from grain growth to nanowires*, Materials Science and Engineering Colloquium, Rensselaer Polytechnic Institute, Troy NY 4/10 (invited).
6. *Self Similarity During Coarsening of Topologically Complex Mixtures*, SIAM Meeting on Mathematical Methods in Materials Science, Philadelphia PA, 6/10 (invited).
7. *Universal Morphologies Near Topological Singularities*, SIAM Meeting on Mathematical Methods in Materials Science, Philadelphia PA, 6/10 (invited).
8. *Universality and topological singularities in materials: Self-Similar Pinch-Off of Rods*, Phase Transformations in Materials '10, Avignon France, 6/10 (invited).
9. *Droplet Dynamics During Vapor-Liquid-Solid Growth*, Whiskers, Wires and Walls workshop, National Institute for Standards and Technology, Gaithersburg MD 9/10 (invited).
10. *Grain Growth at the Nanoscale Using the Phase Field Crystal Method*, RISO Laboratory for Energy and Sustainability, Roskilde Denmark, 8/10 (invited).
11. *Computations and Experiments in Four Dimensions*, Materials Science and Engineering Colloquium, University of California Berkeley, Berkeley CA 10/10 (invited).
12. *Computations and Experiments in Four Dimensions: From Grains to Singularities*, Department of Materials Science and Engineering Colloquium, Purdue University, West Lafayette IN, 12/10 (invited).
13. *Microgravity Research: Past Successes and Future Promise*, AIAA Annual meeting, Orlando, FL 1/11 (invited).
14. *Coarsening in Solid-Liquid Mixture: Results from the ISS*, AIAA Annual meeting, Orlando, FL 1/11 (invited).

15. *The Dynamics of Liquid Drops During Vapor-Liquid-Solid Nanowire Growth*, Materials Science and Engineering Colloquium, North Carolina State University, Raleigh NC, 4/11*.
16. *Grain Growth in Four Dimensions*, TMS Annual meeting, San Diego, CA 2/11 (invited).
17. *Universality and the Pinch-off of Rods by Capillarity*., TMS Annual meeting, San Diego, CA 2/11 (invited).
18. *Phase Field Crystal Calculations of Grain Growth*, Colloquium University of British Columbia, Vancouver CA, 4/11 (invited).
19. *Interfacial Motion at the Nanoscale: Grain Growth, Nanowires and Quantum Dots*, Electron Microscopy and Multiscale Modeling, Lake Tahoe CA 4/11 (invited).
20. *Microgravity Life and Physical Sciences Decadal Study*, European Science Foundation, Strasbourg, France 6/11 (invited).
21. *The Dynamics of Liquid Drops During Vapor-Liquid-Solid Nanowire Growth*, ICMAT 20011, Singapore 6/11 (invited).
22. *Pattern Formation and Atomic Scale Processes in Crystals*, PIRE and OxMos Workshop, Oxford, UK 9/11 (invited).
23. *4D Measurements of Interfacial Evolution*, MS&T meeting, Columbus OH, 10/11 (invited).
24. *Computations and Experiments of Microstructural Evolution in Four Dimensions: From Grains to Topological Singularities*, Materials Science and Engineering Colloquium, Michigan State University, East Lansing MI 10/11 (invited).
25. *Topological Singularities in Materials: Dynamics and Universality*, Physics Department Colloquium, Purdue University, West Lafayette IN, 11/11 (invited).
26. *Oxygen Bubble Nucleation in Solid Oxide Electrolyzer Cells*, MRS Fall meeting, Boston MA, 12/11.
27. *4D Measurements of Interfacial Evolution in Materials*, MRS Fall meeting, Boston MA, 12/11 (invited).
28. *The Dynamics of Liquid Drops During Vapor-Liquid-Solid Nanowire Growth*, 2nd International Symposium on Advanced Materials, Yonsei University, Seoul Korea 2/12 (invited).
29. *Coarsening of Two-Phase Mixtures: Experiments on the International Space Station*, TMS Annual Meeting 3/12 (invited).
30. *Coarsening of Bicontinuous Two-Phase Mixtures*, TMS Annual Meeting 3/12 (invited).

31. *4D measurements of interfacial motion in materials*, NIMS-Northwestern symposium 3/12*.
32. *Compositional Uniformity of Doped Nanowires and the Stability of Nanowire Growth*, Workshop on Heterostructured Materials, Brown University 5/12 (invited).
33. *Compositional Uniformity of Doped Nanowires and the Stability of Nanowire Growth*, Nanowire workshop, St. Petersburg Russia 6/12 (invited).
34. *Vapor-Liquid-Solid Nanowire Growth: Liquid Dynamics and Wire Composition*, NANOSEA, Sardinia Italy 6/12 (invited).
35. *Interfacial Morphology and Evolution in Solid-Liquid Mixtures*, 3D Materials Science, Seven Springs PA, 7/11 (invited).
36. *Computational Materials Science using Phase Field Methods*, Computational Materials Science Summer School, Lawrence Livermore National Laboratory 8/12 (invited).
37. *Line and Defects in Materials*, Institute for Pure and Applied Mathematics, UCLA, Los Angeles CA, 9/12 (invited).
38. *The Evolution of Mushy Zones in Four Dimensions*, MS&T meeting, Pittsburgh PA. 10/12 (invited).
39. *4D Evolution of Interfaces in Materials*, 5th International Symposium on Designing, Processing and Properties of Advanced Engineering Materials, Toyohashi Japan, 10/12. *
40. *Computations and Experiments of Grain Evolution in Four Dimensions*, UCLA, Los Angeles CA, 11/12 (invited).
41. *Insights into Grain Growth Using Phase Field Crystal Simulations*, MRS Fall Meeting, Boston MA, 11/12 (invited).
42. *Coarsening of Solid-Liquid Mixtures*, American Society for Gravitational and Space Research, New Orleans LA, 12/12.
43. *Computational Materials Science: From Atoms to Engine Blocks*, NSF Workshop on the Materials Genome Initiative, Arlington VA, 12/12 (invited).
44. *Time Sequence Tomography of Materials*, Workshop on Data Fusion in Material Science, Dayton OH, 12/12.
45. *Insights into Grain Growth Using Phase Field Crystal Simulations*, Northwestern-Jawaharlal Nehru Center for Advanced Scientific Research Workshop, Bangalore India, 1/13 (invited).
46. *Computational Challenges Posed by Phase Field Method*, SIAM Computational Science and Engineering, 2/13 (invited).

47. *The Composition and Growth of Nanowires*, TMS Annual Meeting, San Antonio TX, 3/13 (invited).
48. *Four-Dimensional Measurement of Interfacial Morphology*, TMS Annual Meeting, San Antonio TX, 3/13 (invited).
49. *The Growth of Twinned and Doped Nanowires*, MRS Spring Meeting, San Francisco CA, 4/13 (invited).
50. *Oxygen bubble nucleation in solid oxide electrolysis cells*, ACS Annual Meeting, New Orleans, LA 4/13 (invited).
51. *3-D X-Ray Diffraction Contrast Tomography Of Grains and Grain Growth*, Advanced Photon Source Colloquium, Argonne IL. 5/13 (invited).
52. *Watching Microstructure Evolve*, Advanced Photon Source Colloquium, Argonne IL. 6/13 (invited).
53. *Watching Microstructure Evolve in Three Dimensions*, Materials Science and Engineering Colloquium, UC Santa Barbara, Santa Barbara CA, 6/13 (invited).
54. *Phase Field Crystal Models of Grain Growth*, SIAM Materials Science Conference, Philadelphia PA, 6/13 (invited).
55. *4D Evolution of Material Microstructure*, Ceramic Processing Science Meeting, Portland OR, 8/13 (invited).
56. *From Serial Sectioning to X-ray Tomography*, International Center for Materials Research Summer school, UC Santa Barbara CA, 8/13 (invited).
57. *Interfacial Evolution in Materials*, Summer School on Microstructural Evolution, Center for Mathematical Sciences, Technion, Israel 8/13 (invited).
58. *Vapor-Liquid-Solid Nanowire Growth: Droplet Stability*. American Vacuum Society Meeting, University of Illinois at Urbana-Champaign, 9/13 (invited)
59. *The Role of Capillarity during Phase Transformations*, J. Williard Gibbs Phase Equilibria Award Lecture, MS&T meeting, Montreal Canada, 11/13 (invited).
60. *Vapor-Liquid-Solid Growth: Twins and Droplet stability*, Nanowire Workshop, Tel Aviv Israel 11/13.
61. *The Morphological Stability of Lamellar Microstructures*, TMS Annual meeting, San Diego CA 2/14 (invited).

62. *Watching the Evolution of Highly Anisotropic Microstructures*, TMS Annual meeting, San Diego CA 2/14 invited.
63. *The Center for Hierarchical Materials Design*, Steel Research Group, Evanston IL, 3/14 (invited).
64. *Center for Hierarchical Materials Design: From Metal Alloys to Biomaterials*, Ford Research Laboratory, Dearborn MI, 4/14 (invited).
65. *The Phase Field Crystal Method: from Grain Growth to Solid-Vapor Interfaces*, Materials Science and Engineering Seminar, Brown University, Providence RI, 4/14 (invited).
66. *The Dynamics of Dislocation-Mediated Grain Growth: Rotation and Translation*, CECAM workshop, Lausanne Switzerland, 6/14 (invited).
67. *Crystallization at the Nanoscale: Insights from Nanowire Growth*, University Pierre and Marie Curie, Paris, France 6/14 (invited).
68. *The Dynamics of Dislocation-Mediated Grain Growth: Rotation and Translation*, 3rd International Phase Field Workshop, State College PA 7/14 (invited).
69. *Dendritic Growth in 4D*, International Conference on Casting and Solidification Processes, Windsor, UK 8/14 (invited).
70. *The Center for Hierarchical Materials Design: From Metals to Biomaterials*, Lawrence Livermore National Laboratory, Livermore CA 8/14 (invited).
71. *The Phase Field Crystal Method*, Banff International Research Station, Banff Canada 10/14 (invited).
72. *Solidification in 4D*, Workshop on the Frontiers of Solidification Research, Cologne Germany 10/14 (invited).
73. *Computational Materials Science and the Materials Genome Initiative*, International Conference for Young Researchers on Advanced Materials, Haikou China 10/14.
74. *Phase Field Modeling of Phase Transformations in Multicomponent Alloys*, ASME National Meeting, Montreal Canada 11/14 (invited).
75. *Insights Into Nanocrystalline Grain Growth Through Phase Field Crystal Calculations*, Institute for Advanced Study, Hong Kong University of Science and Technology, Hong Kong 12/14 (invited).
76. *Phase Field Crystal Method: From Convection to the Evolution of Crystals*, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, England 2/15 (invited).

77. *Vapor-Liquid-Solid Growth: Twins and Wire Composition*, Department of Materials Science and Engineering, University of Tel Aviv, Israel 2/15 (invited).
78. *The Phase Field Crystal Model: Grain Growth and Capillarity*, TMS Annual Meeting, Orlando FL, 3/15 (invited).
79. *Eutectic Solidification: from Multicomponent alloys to the Macroscale*, TMS Annual Meeting, Orlando FL, 3/15 (invited).
80. *Watching Microstructure Evolve Using Phase Contrast X-Ray Imaging*, TMS Annual Meeting, Orlando FL, 3/15 (invited).
81. *Insights Into Nanocrystalline Grain Growth Through Phase Field Crystal Calculations*, Department of Materials Science and Engineering, École Polytechnic Fédérale de Lausanne, Switzerland, 3/15 (invited).
82. *The Center for Hierarchical Materials Design: Realizing the Vision of the Materials Genome Initiative*, HERO-M meeting, Stockholm, Sweden 5/15. (invited)
83. *Coarsening of Two-Phase Mixtures: From Particles to Bicontinuous Phases*, Hillert-Cahn Lecture, International Conference on Solid-Solid Phase Transformations, Whistler, Canada 8/15. (invited).
84. *The Center for Hierarchical Materials Design: Realizing the Vision of the Materials Genome Initiative*. International Summit Forum on the Materials Genome Initiative, China-MGI'2015, Shanghai China, 8/15 (invited).
85. *Quantum Dot Formation on Nanowires*, YUCO-MAT meeting, Materials Research Society of Serbia, Herceg Novi Montenegro, 9/15 (invited).
86. *The Dynamics of Epitaxy*, PULSE summer school, Porquorolles France, 9/15 (invited).
87. *Dislocations, Trijunctions and Grain Boundary Motion*. Materials Science Division lecture, Argonne National Laboratory, 10/15 (invited).
88. *The Growth of Crystals and Eutectics with Faceted Interfaces*, Groupement de Recherche Solidification of Metals symposium, University of Paris 6, 12/15 (invited).
89. *Computational Materials Science: From Atoms to Microstructure*, Plasticity, Damage and Fracture 2016, 1/16 (invited).
90. *A Verified Phase Field Method for Phase Transformations in Ni-Cr-Al Alloys*, Plasticity, Damage and Fracture 2016, 1/16 (invited).

91. *The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative*, SIP-Structural Materials for Innovation Review, Japan Science and Technology Office, Japan 2/16 (invited).
92. *The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative*, Opening Ceremony Research Center for the Computational Design of Advanced Functional Materials, National Institute for Advanced Industrial Science and Technology, Japan 2/16 (plenary).
93. *Quantum Dot Formation in Core-Shell Nanowires*, Lawrence Symposium on Epitaxy, Arizona State University, 2/16 (invited).
94. *Dislocations, Trijunctions and Grain Boundary Motion*, Materials Science Colloquium, California Institute of Technology, 2/16 (invited).
95. *Solidification in 4D*, Rappaz Symposium, TMS Annual meeting 2/16 (invited).
96. *From The Center for Hierarchical Materials Design to a New Tool for Materials Simulation*, National Institute for Materials Science, Japan 3/16 (invited).
97. *The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative*, National Academy of Engineering-American Association of Engineering Societies Convocation of Professional Societies, 4/16 (invited).
98. *Quantifying Microstructure Evolution in Three Dimensions*, Spring Materials Research Society meeting, 4/16 (invited).
99. *The Evolution of the Structure of Materials: from Atoms to the Continuum*, Fields Institute University of Toronto, 5/16 (invited).
100. *Dislocations, Trijunctions and Grain Boundary Motion*, SIAM Mathematics in Materials Science meeting, 5/16 (invited).
101. *The Stability of Solid Oxide Fuel Cells: Insights Through In Situ X-Ray Tomography*, Electrochemical Society Meeting, 6/16 (invited).
102. *4D Tomography of Solidification: Dynamics and Microstructure*, AFOSR Workshop, London 5/16 (invited).
103. *The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative*, Institute for Materials Research, Materials Week Ohio State University, 5/16. (invited)
104. *Quantum Dot Formation in Core-Shell Nanowires*, Nanosea 2016, France 7/16 (invited).

105. *The Topology and Morphology of Nanoporous Metals*, Second International Symposium on Nanoporous Materials by Alloy Corrosion, Germany 9/16 (invited).
106. *The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative*, CINEMA meeting, Copenhagen Denmark, 9/16 (invited).
107. *Solidification in 4D: from Dendrites to Eutectics* Multiscale Modeling in Materials Science, Dijon France, 10/16 (invited).
108. *The Center for Hierarchical Materials Design: Realizing the Promise of the Materials Genome Initiative*, National Institute for Materials Science, NIMS Week, 10/16. (plenary)
109. *Phase Field Crystal Simulations of Grain Growth in Three Dimensions*, J.J. Hoyt Symposium, McMaster University, Canada, 11/16 (invited).
110. *Coarsening of Solid-Liquid Mixtures in Microgravity*, The 5th Forum for New Leaders in Space Science, Chinese Academy of Sciences – National Academy of Sciences Workshop, Beijing China 12/16 (invited).
111. *A Phase Field Crystal Model for Ordered Crystals*, International Conference on Plasticity Damage and Fracture 2017, Mexico, 1/17 (invited).
112. *Materials Databases via X-Ray Tomography*, International Conference on Plasticity Damage and Fracture 2017. Mexico, 1/17 (invited).
113. *Quantum Dot Formation In Core-Shell Nanowires*, TMS-Annual Meeting 2017, San Diego CA, 2/17 (invited).
114. *The Phase Field Method and Materials Design*, TMS-Annual Meeting 2017, San Diego CA, 2/17 (invited).
115. *Creating Materials Databases Using X-Ray Tomography*, TMS-Annual Meeting 2017, San Diego CA, 2/17 (plenary).
116. *Dislocations, Trijunctions and Grain Rotation*, TMS-Annual Meeting 2017, San Diego CA, 2/17 (invited).
117. *Solidification in 4D: from Dendrites to Eutectics*, Applied Physics Colloquium, Harvard University, Boston MA, 2/10 (invited).
118. *The Phase Field Method*, Northwestern University – National Institute for Materials Science Materials Genome Meeting, Evanston 3/17 (invited).
119. *Solidification in 4D: from Dendrites to Eutectics*, The 10th Thailand International Metallurgy Conference, Bangkok, Thailand 3/17 (plenary).

120. *Three-Dimensional Grain Growth—The Role of Dislocations*, MRS Spring meeting, Phoenix AZ, 4/17 (invited).
121. *Microstructural Evolution in Materials*, Advanced Photon Source Users Meeting, Argonne IL, 6/17 (plenary).
122. *Creating Materials Databases using X-ray Tomography*, Advanced Photon Source Users Meeting, Argonne IL, 6/17 (invited).
123. *Phase Field Crystal Method: Three-Dimensional Grain Growth and the Role of Dislocations*, Engineering Mechanics Institute, San Diego CA, 6/16 (invited).
124. *Dendrite Fragmentation and the Columnar-to-Equiaxed Transition During Solidification*, U.S. National Congress on Computational Mechanics, Montreal Canada, 7/17 (invited).
125. *Solidification in 4D: Quantification of Microstructure*, Solidification Processing'17, Windsor England, 7/17 (invited).
126. *The Phase Field Crystal Method: Strengths and Weaknesses*, Workshop on New algorithms for Exploring Structure and Dynamics of Interfaces, University of British Columbia, 7/17 (invited).
127. *Solidification in 4D: from Dendrites to Eutectics*, Microscopy and Microanalysis, St. Louis MO, 8/17 (invited).
128. *Phase Field Methods: From Materials Design to Phase Field Crystals*, PRISMS meeting, Ann Arbor MI, 8/17 (invited).
129. *The Phase Field Method: From Materials Design to Materials Databases*, Shanghai University-Northwestern University Workshop on the Materials Genome Initiative, Shanghai China, 9/17 (invited).
130. *The Center for Hierarchical Materials Design*, Shanghai Jiao Tong University. Materials Genome Initiative Center, Shanghai China, 9/17 (invited).
131. *Dislocations, Trijunctions and Grain Boundary Motion*, Materials Science and Engineering Colloquium, University of Wisconsin, Madison WI 9/17 (invited).
132. *Solidification in 4D: from Dendrites to Eutectics*, European Materials Congress, Thessaloniki Greece, 9/17.
133. *The Role of Infrastructure in Materials Informatics*, Materials Science and Technology 2017, Pittsburgh PA, 9/17 (invited).

134. *Dendrite Coarsening in the Low Volume Fraction Limit*. American Society for Gravitational and Space Research, Seattle WA, 10/17.
135. *Phase Field Models and Interfacial Evolution: A Critical Test of Simulation*, Materials Research Society Fall meeting, 12/17.
136. *Three-Dimensional Grain Growth: The Role of Dislocations and Deformation*, Plasticity 2018, San Juan, Puerto Rico, 1/18 (Invited).
137. *Dislocations, Trijunctions and Grain Boundary Motion*, Materials Science and Engineering colloquium, Rice University, 1/18 (invited).
138. *Phase Field Methods*, GIAN Lecture Series, Indian Institute of Technology Bombay, Mumbai, India, 3/18 (invited).
139. *Solidification in 4D: from Dendrites to Eutectics and Microstructure*, Institute Lecture, Indian Institute of Technology Bombay, 3/18 (invited).

Publications

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