Jonathan A. Dantzig

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Research Interests:

Materials processing, especially solidification and casting processes. Mathematical modeling of solidification processes in metals and biological systems, and microstructure formation. Specialties include finite element methods, heat transfer and fluid dynamics.

Education:

Ph.D., Mechanics and Materials Science, The Johns Hopkins University, 1977

M.S.E., Mechanics, The Johns Hopkins University, 1975

B.S.E., Mechanics, The Johns Hopkins University, 1972

Employment:

Invited Professor, École Polytechnique Fédérale de Lausanne, 2005-present

Visiting Researcher, National Institute for Standards and Technology, 2004

Department of Mechanical Science and Engineering
University of Illinois at Urbana-Champaign

- Professor Emeritus and Research Professor, 2008 - present
- W. Grafton and Lillian B. Wilkins Professor of Mechanical Engineering, 2003 - 2008
- Professor, 1996 - 2008
- Division Head, Design and Materials, 1993 - 1996
- Associate Professor, 1987 - 1996
- Assistant Professor, 1982 - 1987
- Courses taught:

  ME231: Introduction to Materials Behavior and Processing

ME261: Instrumentation and Control
ME280: Senior Capstone Design
ME345: Introduction to Finite Element Analysis
ME351: Introduction to Materials Processing (New)
ME389: Introduction to Solidification Processing
ME452: Advanced Solidification Processing
ME497: Advanced Modeling of Materials Processing (New)

Visiting Research Scientist, NCSA, 1990-91

Olin Metals Research Laboratories
New Haven, CT

- Senior Research Scientist, 1980 - 1982
- Research Scientist, 1978 - 1980

University of New Haven
New Haven, CT

- Adjunct Assistant Professor, 1978-1982

Honors and Awards:

Distinguished Educator Award: TMS, 2009

W. A. Agnew/C. N. Goodall Award from Railway Division of IMechE for "Heat Transfer Modeling of Rail Thermite Welds" and "Weld Defect Formation in Rail Thermite Welds," *J. Rail and Rapid Transit, Proceedings Part F*, 2006

Keynote speaker: Modeling of Casting, Welding and Advanced Solidification Processes-XI, Opio, France, 2006

College of Engineering Award for Teaching Excellence: UIUC, 2005

Bruce Chalmers Award: TMS, 2005. Citation: "For his many landmark contributions to the development and application of rigorous tools for computational modeling of solidification processes."

W. Grafton and Lillian B. Wilkins Professor of Mechanical Engineering, UIUC, 2003

Invited speaker: Gordon Conference on Gravitational Effects in Physico-Chemical Systems, 2001

Keynote Speaker: EuroMat, Munich, 1999

Invited Speaker: Cutting Edge of Computer Simulation of Solidification and Processes, Osaka University, 1999

Invited Speaker: Computer Simulation of Microstructures, TMS Fall Meeting, Cincinnati, 1999

Fellow, ASM International, 1998

Best Poster, 8th Engineering Foundation Conference on Modeling of Casting and Advanced Solidification, 1998

Keynote Speaker: SolFIDAP, Berlin, 1998

Invited Speaker: Los Alamos National Laboratory Summer Workshop, Los Alamos, 1996

Keynote Speaker: Gordon Conference on Physical Metallurgy, New Hampshire, 1996

Invited Speaker: Institute for Mechanics and Materials, Brown University, 1995

Invited US participant in 2nd US-Japan Seminar on Solidification Processing of Advanced Materials, New Hampshire, 1994

Keynote Speaker: "Modeling of Casting, Welding and Advanced Solidification Processes–VI," Palm Coast, FL, March 1993

Invited presentation: "Optimization of Solidification Processes" at NATO Workshop on Interaction of Convection with Interfaces, Chamonix, France, March 1992

Best Paper, 5th Engineering Foundation Conference on Modeling of Casting and Advanced Solidification, 1990

Invited US participant in 1st US-Japan Seminar on Solidification Processing of Advanced Materials, Oiso, Japan, 1990

Member, NASA Metals and Alloys Discipline Working Group, 1984 - 1998

Union Oil Young Faculty Award, 1985-88

Arnold O. Beckman Award, University Research Board, UIUC, 1982

Sigma Xi, 1982

Phi Beta Kappa, 1972

Tau Beta Pi, 1971

Professional Society Activities

Instructor for "Solidification," a one-week short course sponsored annually by ESI (formerly CALCOM) 1997, 1999-present. This course has been taught since 1999 in Les Diablerets, Switzerland. The typical audience each year consists of 25-30 engineers from 15 different countries all over the world.

Member of Scientific Committee, Modeling of Casting, Welding and Advanced Solidification Processes - XI, 2005

Panel Member, Bridging Design and Manufacturing, National Research Council, 2003-2004

Member of Steering Committee, Processing and Properties of Semi-Solid Materials - 5, 1998

Member of Organizing Committee, Modeling of Casting, Welding and Advanced Solidification Processes - VIII, Engineering Foundation, 1998

Co-Chairman of symposium, Modeling. Characterization and Control of Microstructure, TMS-AIME, 1997

Member of Organizing Committee, Modeling of Casting, Welding and Advanced Solidification Processes - VII, Engineering Foundation, 1996

Co-Chairman of symposium, Nature and Properties of Semi-Solid Materials, TMS-AIME, 1992

Conference Chairman, Modeling of Casting and Welding Processes - II, Engineering Foundation, 1983

Member, ASM International, 1972-Present

Member, TMS-AIME, 1977-Present

- Member, Information Technology Committee
- Member, Solidification Committee (Chair, 1988-89)
- Member, SCAMP Committee

Journal Editorships and Reviewerships

Key Reader, *Metallurgical and Materials Transactions - A* (Chairman of Board of Review, 1995-1996)

Key Reader, *Metallurgical and Materials Transactions - B*

Editorial Board, *Modeling and Simulation in Materials Science and Engineering*

Reviewer, *Journal of Computational Physics*

Reviewer, *ASME Journal of Fluids Engineering*

Reviewer, *International Journal of Numerical Methods in Engineering*

Reviewer, *International Journal of Numerical Methods for Fluids*

Reviewer, *Journal of Engineering for Industry*

Reviewer, *Materials Science and Engineering*

Reviewer, *Physica D*

Reviewer, *Physical Review E*

Reviewer, National Science Foundation

Reviewer, NASA

Graduate Advisees:

Masters

Student	Year	Current Location
Jeffrey Wiese	1984	Nonlinear Engineering
Kenneth Michalek	1984	Bell Laboratories
Ron Walling	1986	Cummins Engine Corporation
Long-Sun Chao	1986	Taiwan National University
Steven Shoopman	1992	Ford Motor Company
Timothy Morthland	1993	Southern Illinois University School of Medicine
Michael Tiller	1993	Dynopsys.com
Paul Byrne	1994	Proctor and Gamble
Kevin Rentzsch	1995	Proctor and Gamble
Sepehr Ebrahimi	1995	Hughes Aerospace
K. Jarrett New	1997	Ford Motor Company
Dan Metzger	1999	Hamilton Standard
Melissa Bloch	2000	Kimberley-Clark
Anthony Chang	2002	MIT Lincoln Labs
Brad Robinson	2001	General Electric
Shawn Harnish	2004	Gamma Technologies
Roy Maske	2005	Caterpillar

Student	Year	Current Location
Maragret Koker	2009	Max Planck Institut, Stuttgart
Joseph Miksan	2009	ProductSpace Solutions

PhD

Student	Year	Current Location
Jeffrey Wiese	1987	Nonlinear Engineering
Long-Sun Chao	1987	Taiwan National University
James Kelly	1989	Air Liquide
David Goettsch	1991	General Motors Corporation
Thomas O'Connor	1992	Lawrence Livermore National Laboratories
Ron Walling	1992	Cummins Engine Corporation
Nagendra Palle	1993	Openlane
Zing-Xi Wang	1994	Ford Motor Company
Michael Tiller	1995	LMS International
Robert McDavid	1997	Caterpillar, Inc.
Jay Roplekar	1999	Caterpillar, Inc.
Matt Newman	2001	Procter and Gamble
Yung-Tae Kim	2003	DePaul University
Badri Athreya	2006	Caterpillar, Inc.
Anthony Chang	2006	MIT Lincoln Labs
Natarajan Kumar	2010	General Electric
Zhi Huang	2006-	Caterpillar, Inc.

Postdoctoral

Postdoc	Years	Current Location
Nikolas Provatas	1996-1999	McMaster University
Jun-Ho Jeong	1999-2001	KIMM
Navot Israeli	2001-2003	Weissman Institute

Publications:

Books

[1] J. A. Dantzig and M. Rappaz. *Solidification*. CRC Press, New York, 2009.

[2] J. A. Dantzig and Charles L. Tucker III. *Modeling in Materials Processing*. Cambridge University Press, New York, 2001.

[3] S. P. Marsh, J. A. Dantzig, R. Trivedi, W. Hofmeister, M. Chu, E. Lavernia, and J.-H. Chun, editors. *Solidification 1998*. TMS-AIME, Warrendale, PA, 1998.

[4] J. A. Dantzig. Landing an academic job: The process and pitfalls. via WWW http://quattro.me.uiuc.edu/~jon, University of Illinois, 1995.

[5] J. A. Sekhar and J. A. Dantzig, editors. *Nature and Properties of Semi-Solid Materials*. TMS-AIME, Warrendale, PA, 1992.

[6] J. A. Dantzig and J. T. Berry, editors. *Modeling of Casting and Welding Processes-II*. TMS-AIME, Warrendale, PA, 1984.

Book Chapters

[1] J. A. Dantzig. Materials processing: Soldification - models and simulation. In G. Bassani, G. Liedle, and P. Wyder, editors, *Encyclopedia of Condensed Matter Physics*, pages 401–408. Elsevier, 2005.

[2] J. A. Dantzig. Solidification processes: From dendrites to design. In D. Raabe, F. Roters, F. Barlat, and L-Q. Chen, editors, *Continuum Scale Simulation of Engineering Materials Fundamentals - Microstructures - Process Applications*, pages 633–640. Wiley, 2004.

[3] J. A. Dantzig. Numerical methods for modeling in materials science. In K. H. J. Buschow, R. W. Cahn, M. C. Flemings, B. Ilschner, E. J. Kramer, and S. Mahajan, editors, *Encyclopedia of Materials Science and Technology*, pages 5700–5712. Elsevier Science, 2001.

[4] N. Provatas and J. A. Dantzig. Modeling dendritic growth. In K. H. J. Buschow, R. W. Cahn, M. C. Flemings, B. Ilschner, E. J. Kramer, and S. Mahajan, editors, *Encyclopedia of Materials Science and Technology*. Elsevier Science, 2001.

[5] J. A. Dantzig and B. G. Thomas. *Computer Modeling in Continuous Casting*, volume 31, Encyclopedia of Advanced Materials, page 4. 1993. D. Bloor, R. J. Brook, M. C. Flemings and S. Mahajan, eds.

[6] J. A. Dantzig and L. S. Chao. *Fluid Flow and Microstructure Development*, volume 130, Low-Gravity Fluid Dynamics and Transport Phenomena, of *Progress in Astronautics and Aeronautics*. AIAA, Washington, DC, 1990. J. N. Koster and R. L. Sani, eds.

Journal Articles

[1] Pak Yuen Chan, Nigel Goldenfeld, and Jonathan Dantzig. Molecular dynamics on diffusive time scales from the phase-field-crystal equation. *Phys. Rev. E*, 79(3, Part 2), 2009.

[2] Stephane Vernede, Jonathan A. Dantzig, and Michel Rappaz. A mesoscale granular model for the mechanical behavior of alloys during solidification. *Acta Materialia*, 57(5):1554–1569, 2009.

[3] N. Chennemalai Kumar, J. A. Dantzig, and I. Jasiuk. Modeling of cortical bone adaptation in a rat ulna: effect of frequency. *Bone*, 50:792–797, 2012.

[4] N. Chennemalai Kumar, I. Jasiuk, and J. A. Dantzig. Dissipation energy as a stimulus fr cortical bone adaptation. *Journal of mechanics of materials and structures*, 6:303–319, 2011.

[5] P. Y. Chan, G. Tsekenis, J. Dantzig, K. A. Dahmen, and N. Goldenfeld. Plasticity and dislocation dynamics in a phase field crystal model. *Phys. Rev. Lett.*, 105, 2010.

[6] N. Guttenberg, N. Goldenfeld, and J. Dantzig. Emergence of foams from the breakdown of the phase field crystal model. *Phys. Rev. E*, 81:065301, 2010.

[7] N. Chennimalai Kumar, J. A. Dantzig, I. M. Jasiuk, A. G. Robling, and C. H. Turner. Numerical modeling of long bone adaptation due to mechanical loading: Correlation with experiments. *Annals of Biomedical Engineering*, 38:594–604, 2010.

[8] B. P. Athreya, N. Goldenfeld, J. A. Dantzig, M. Greenwood, and N. Provatas. Adaptive mesh computation of polycrystalline pattern formation using a renormalization-group reduction of the phase-field crystal model. *Phys. Rev. E*, 76:056706:1–14, 2007.

[9] A. Chang, J. A. Dantzig, B. T. Darr, and A. Hubel. Modeling the interaction of biological cells with a solidifying interface. *J. Comp. Phys.*, 226:1808–1827, 2007.

[10] A. Hubel, B. T. Darr, A. Chang, and J. A. Dantzig. Cell partitioning during the directional solidification of trehalose solutions. *Cryobiology*, 55:182–188, 2007.

[11] N. Provatas, J. A. Dantzig, B. P. Athreya, P.-Y. Chan, P. Stefanovic, N. Goldenfeld, and K. Elder. Using the phase-field crystal method in the multi-scale modeling of microstructure evolution. *J. Metals*, 59(7):83–90, 2007.

[12] B. P. Athreya, J. A. Dantzig, S. Liu, and R. Trivedi. On the role of confinement of solidification in pure materials and binary alloys. *Philosophical Magazine*, 86(24):3739–3756, 2006.

[13] B. P. Athreya, N. Goldenfeld, and J. A. Dantzig. Renormalization group theory for the phase field crystal equation. *Physical Review E*, 74:011601, 2006.

[14] Y. Chen, F. V. Lawrence, C. P. L. Barkan, and J. A. Dantzig. Heat transfer modeling of rail thermite welding. *Proceedings of the Institution of Mechanical Engineers, Part F: J. Rail and Rapid Transit*, 220(3):207–217, 2006.

[15] Y. Chen, F. V. Lawrence, C. P. L. Barkan, and J. A. Dantzig. Weld defect formation in rail thermite welds. *Proceedings of the Institution of Mechanical Engineers, Part F: J. Rail and Rapid Transit*, 220:373–384, 2006.

[16] 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. *Metallurgical and Materials Transactions*, 37A:2701–2714, 2006.

[17] N. Goldenfeld, B. P. Athreya, and J. A. Dantzig. Renormalization group approach to multiscale modeling in materials science. *J. Stat. Phys.*, 125(5/6):1019–1027, 2006. DOI: 10.1007/s10955-005-9013-7.

[18] B. Han, J. H. Choi, J. A. Dantzig, and J. C. Bischof. A quantitative analysis of latent heat of an aqueous binary mixture. *Cryobiology*, 52(1):146–151, 2006.

[19] K. Wang, A. Chang, L. V. Kale, and J. A. Dantzig. Parallelization of a level set method for simulating dendritic growth. *J. Parallel and Distributed Computing*, 66(11):1379–1386, 2006.

[20] N. Goldenfeld, B. P. Athreya, and J. A. Dantzig. Renormalization group approach to multiscale simulation of polycrystalline materials using the phase field crystal model. *Phys Rev E (Rapid Comm)*, pages 020601:1–4, 2005.

[21] S. F. Harnish, H. A. Padilla, B. E. Gore, J. A. Dantzig, A. J. Beaudoin, I. M. Robertson, and H. Weiland. High temperature behavior and hot rolling of AA705X. *Met. Mater. Trans.*, 36A(2):357–370, 2005.

[22] N. Provatas, M. Greenwood, B. Athreya, N. Goldenfeld, and J. Dantzig. Multiscale modeling of solidification: Phase-field methods to adaptive mesh refinement. *Intl. J. Modern Physics B*, 19(31):4525–4565, 2005.

[23] A. Chang and J. Dantzig. Improved sand surface element for residual stress determination. *Applied Mathematical Modeling*, 28(6):533–546, 2004.

[24] J.-H. Jeong, J. A. Dantzig, and N. Goldenfeld. Dendritic growth with fluid flow in pure materials. *Met. Mater. Trans.*, 34A(3):459–466, 2003.

[25] M. L. Newman, B. J. Robinson, H. Sehitoglu, and J. A. Dantzig. Deformation, residual stress, and constitutive relations for quenched w319 aluminum. *Met. Mater. Trans.*, 34A(7):1483–1491, 2003.

[26] J.-H. Jeong, N. Goldenfeld, and J. A. Dantzig. Phase field model for three-dimensional dendritic growth with fluid flow. *Physical Review E*, 64:041602:1–14, 2001.

[27] D. Metzger, K. J. New, and J. A. Dantzig. A sand surface element for efficient modeling of residual stress in castings. *App. Math. Modeling*, 25(10):825–842, 2001.

[28] J. K. Roplekar and J. A. Dantzig. A study of solidification with a rotating magnetic field. *Intl. J. Cast Metals Research*, 14(2):79–98, 2001.

[29] J. A. Dantzig. Solidification modeling: Status and outlook. *J. Metals*, 52(12):18–21, 2000.

[30] Y-T. Kim, N. Goldenfeld, and J. A. Dantzig. Computation of dendritic microstructures using a level set method. *Physical Review E*, 62:2471–2474, 2000.

[31] J. A. Dantzig. Modeling solidification processes using FiDAP. *Cryst. Res. Technol.*, 34(4):417–424, 1999.

[32] Y-T. Kim, N. Provatas, N. Goldenfeld, and J. A. Dantzig. Universal dynamics of phase field models for dendritic growth. *Physical Review E*, 59(3):2546–2549, 1999.

[33] P. Michaleris, J. A. Dantzig, and D. A. Tortorelli. Minimization of welding residual stress and distortion in large structures. *Welding Journal*, 78(11):361s–366s, 1999.

[34] N. Provatas, N. Goldenfeld, and J. A. Dantzig. Adaptive mesh refinement computation of solidification microstructures using dynamic data structures. *Journal of Computational Physics*, 148:265–290, 1999.

[35] N. Provatas, N. Goldenfeld, J. A. Dantzig, J. C. LaCombe, A. Lupulescu, M. B. Koss, M. E. Glicksman, and R. Almgren. Crossover scaling in dendritic growth evolution at low undercooling. *Physical Review Letters*, 82(22):4496–4499, 1999.

[36] R. M. McDavid and J. A. Dantzig. Design sensitivity and finite element analysis of free surface flows with application to optimal design of casting rigging systems. *International Journal for Numerical Methods in Fluids*, 28:419–442, 1998.

[37] R. M. McDavid and J. A. Dantzig. Fluid flow in casting rigging systems: Modeling, validation, and optimal design. *Metallurgical and Materials Transactions*, 29B:679–690, 1998.

[38] N. Provatas, N. Goldenfeld, and J. A. Dantzig. Efficient computation of dendritic microstructures using adaptive mesh refinement. *Physical Review Letters*, 80(15):3308–3311, 1998.

[39] S. A. Ebrahimi, D. A. Tortorelli, and J. A. Dantzig. Sensitivity analysis and nonlinear programming applied to investment casting design. *Applied Mathematical Modeling*, 21(2):113–123, 1997.

[40] P. E. Byrne, D. A. Tortorelli, and J. A. Dantzig. Solidification control by numerical optimization. *Video Journal of Engineering Research*, 1:CD track 2, 1996.

[41] N. Palle and J. A. Dantzig. An adaptive mesh refinement scheme for solidification problems. *Metallurgical and Materials Transactions A*, 27A:707–717, 1996.

[42] M. M. Tiller and J. A. Dantzig. Implementation of design sensitivity analysis and numerical optimization. *Applied Mathematical Modeling*, 20(11):792–799, 1996.

[43] Z.-X. Wang, D. A. Tortorelli, and J. A. Dantzig. Sensitivity analysis and optimization of coupled thermal and flow problems with applications to contraction design. *International Journal for Numerical Methods in Fluids*, 23:991–1020, 1996.

[44] A. M. Jones, M. L. Osowski, R. M. Lammert, J. A. Dantzig, and J. J. Coleman. Growth characterization and modeling of ternary InGaAs-GaAs quantum wells by selective-area MOCVD. *Journal of Electronic Materials*, 24:1631–1636, 1995.

[45] T. E. Morthland, P. E. Byrne, D. A. Tortorelli, and J. A. Dantzig. Optimal riser design for metal castings. *Metallurgical and Materials Transactions*, 26B:871–885, 1995.

[46] M. Cockerill, D. V. Forbes, H. Han, B. A. Turkot, J. A. Dantzig, I. M. Robertson, and J. J. Coleman. Wavelength tuning in strained layer InGaAs-GaAs-AlGaAs quantum well lasers be selective area epitaxy. *Journal of Optical Electronics*, 23(2):115–119, 1994.

[47] T. M. Cockerill, D. V. Forbes, J. A. Dantzig, , and J. J. Coleman. Strained layer InGaAs-GaAs-AlGaAs buried heterostructure quantum well lasers by three-step selective area metalorganic chemical vapor deposition. *IEEE Journal of Quantum Electronics*, 30(2):441–445, 1994.

[48] D. D. Goettsch and J. A. Dantzig. Modeling microstructure development in gray iron castings. *Metallurgical and Materials Transactions*, 25A(5):1063–1080, 1994.

[49] T. G. O'Connor and J. A. Dantzig. Modeling the thin slab continuous casting mold. *Metallurgical and Materials Transactions*, 25B(3):443–457, 1994.

[50] D. A. Tortorelli, M. M. Tiller, and J. A. Dantzig. Optimal design of nonlinear parabolic systems. Part I: Fixed spatial domain with application to process optimization. *Computer Methods in Applied Mechanics and Engineering*, 113(1-2):141–155, 1994.

[51] D. A. Tortorelli, J. A. Tomasko, T. E. Morthland, and J. A. Dantzig. Optimal design of nonlinear parabolic systems. Part II: Variable spatial domain with application to process optimization. *Computer Methods in Applied Mechanics and Engineering*, 113(1-2):157–172, 1994.

[52] R. A. Walling and J. A. Dantzig. Mechanisms of mold filling in the expendable pattern casting process. *AFS Transactions*, 102:849–854, 1994.

[53] J. W. Wiese and J. A. Dantzig. Modeling stress development during the solidification of gray iron castings. *Metallurgical Transactions*, 21A(2):489–497, 1990.

[54] J. A. Dantzig. Modeling of liquid-solid phase changes with melt convection. *International Journal of Numerical Methods in Engineering*, 28:1769–1785, 1989.

[55] J. A. Dantzig. Thermal stress development in metal casting processes. *Metallurgical Science and Technology*, 7(3):133–178, 1989.

[56] J. A. Dantzig and J. W. Wiese. Spider and the boundary curvature method: Simulating the solidification of foundry castings. *Applied Mathematical Modeling*, 12(4):213–220, 1988.

[57] J. E. Kelly, K. P. Michalek, T. P. O'Connor, B. G. Thomas, and J. A. Dantzig. Initial development of thermal and stress fields in continuously cast steel billets. *Metallurgical Transactions*, 19A(10):2589–2592, 1988.

[58] T. P. O'Connor, J. E. Kelly, and J. A. Dantzig. Mathematical models for steel billet castings. *J. Metals*, 40:4, 1988.

[59] R. P. Walling and J. A. Dantzig. Effects of fluid flow on solidification microstructure. *J. Metals*, 40:A15, 1988.

[60] J. A. Dantzig. Mathematical modeling of solidification processes. *Technology for Premium Quality Castings*, 1987. AIME, Warrendale, PA.

[61] J. A. Dantzig and L. S. Chao. Cellular growth into a shearing flow. *Solidification Processing*, page 502, 1987. H. Jones, ed.

[62] J. A. Dantzig and J. W. Wiese. Modeling the solidification of foundry castings. *Advanced Manufacturing Processes*, 1(3/4):437–454, 1986.

[63] J. A. Dantzig. Improved transient response of thermocouple sensors. *Review of Scientific Instruments*, 56(5):723–725, 1985.

[64] J. A. Dantzig and S. C. Lu. Modeling of heat flow in sand castings part i–the boundary curvature method. *Metallurgical Transactions*, 16B(2):195–202, 1985.

[65] J. A. Dantzig and J. W. Wiese. Modeling of heat flow in sand castings part ii–applications of the boundary curvature method. *Metallurgical Transactions*, 16B(2):203–209, 1985.

[66] J. A. Dantzig, J. A. Clumpner, and D. E. Tyler. Degassing of static melts by insoluble purge gases. *Metallurgical Transactions*, 11B(3/4):433–438, 1980.

[67] J. A. Dantzig and S. H. Davis. Analysis for prediction of non-equilibrium phase formation in rapid conduction cooling. *Materials Science and Engineering*, 32:199–209, 1978.

[68] J. A. Dantzig and Jr. R. E. Green. Flash x-ray diffraction systems. *Advances in X-Ray Analysis*, 16:229–241, 1972.

Refereed Conference Proceedings

[1] J. A. Dantzig, B. P. Athreya, A. Chang, and N. Goldenfeld. Multiscale modeling of solidification microstructure. In C-A. Gandin and M. Bellet, editors, *Modeling of Casting, Welding, and Advanced Solidification Processes - XI*, pages 25–32, Warrendale, PA, 2006. TMS-AIME.

[2] B. P. Athreya and J. A. Dantzig. Dendritic growth in confined spaces. In M. Rappaz, C. Beckermann, and R. Trivedi, editors, *Solidification processes and microstructures: A symposium in honor of Wilfried Kurz*, pages 357–368, Warrendale, PA, 2004. TMS-AIME.

[3] J. A. Dantzig, J.-H. Jeong, and N. Goldenfeld. Dendritic growth with fluid flow in pure materials. In D. M. Stefanescu, J. A. Warren, M. R. Jolly, and M. J. M. Krane, editors, *Modeling of Casting, Welding, and Advanced Solidification Processes - X*, pages 13–20, Warrendale, PA, 2003. TMS-AIME.

[4] B. E. Gore, S. Harnish, H. Padilla, B. J. Robinson, A. J. Beaudoin, J. A. Dantzig, and H. Weiland. High temperature properties and processing of aa7050. In Z. Jin, T. Bieler, A. J. Beaudoin, and B. Radhikrishnan, editors, *Hot Deformation of Aluminum*, pages 255–262, Warrendale, PA, 2003. TMS-AIME.

[5] J. A. Dantzig, N. Provatas, N. Goldenfeld, J. C. LaCombe, M. B. Koss, and M. E. Glicksman. A comparison of phase-feild computations with experimental microgravity measurements for dendritic growth in pure materials. In P. R. Sahm, P. N. Hansen, and J. G. Conley, editors, *Modeling of Casting, Welding, and Advanced Solidification Processes - IX*, pages 453–460, Aachen, 2000. Shaker Verlag.

[6] D. L. Metzger, K. J. New, and J. A. Dantzig. Development of a sand surface element for improved residual stress determination. In I. Ohnaka, editor, *Cutting edge of computer simulation of solidification and casting*, pages 173–202, 1999.

[7] J. A. Dantzig and J. K. Roplekar. A mathematical model of the mhd-dc casting process. In A. K. Bhasin, J. J. Moore, K. P. Young, and S. Midson, editors, *Semi-Solid Processing of Alloys and Composites - V*, pages 241–248. Colorado School of Mines, 1998.

[8] R. M. McDavid and J. A. Dantzig. Experimental and numerical investigation of mold filling. In B. G. Thomas and C. Beckermann, editors, *Modeling of Casting, Welding, and Advanced Solidification Processes - VIII*, pages 59–66, San Diego, CA, 1998. TMS-AIME.

[9] N. Provatas, N. Goldenfeld, and J. A. Dantzig. Adaptive grid methods in solification microstructure modeling. In B. G. Thomas and C. Beckermann, editors, *Modeling of Casting, Welding, and Advanced Solidification Processes - VIII*, pages 533–540, San Diego, CA, 1998. TMS-AIME.

[10] P. E. Byrne, P. Michaleris, D. A. Tortorelli, and J. A. Dantzig. Optimal design applications in casting and welding. In M. Cross and J. Campbell, editors, *Modeling of Casting, Welding, and Advanced Solidification Processes-VII*, pages 365–372, London, England, 1995. TMS-AIME.

[11] J. A. Dantzig, S. A. Ebrahimi, and D. A. Tortorelli. Optimal casting design. In S-F. Shen and P. R. Dawson, editors, *Materials Processing: Theory, Methods and Applications; NUMIFORM '95*, pages 1119–1124, Ithaca, NY, 1995. Balkema.

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