

Theodore L. Bergman

Charles E. and Mary Jane Spahr Professor
Department of Mechanical Engineering
The University of Kansas

I. Background Information U.S. Citizen. Married with two adult children.

II. Graduate and Undergraduate Education

Ph.D. Mechanical Engineering, Purdue University, 1981-1985
MSME Mechanical Engineering, Purdue University, 1980 -1981
BSME Mechanical Engineering, University of Kansas, 1974 -1978

IIIa. Professional Positions

2012-present	<i>Charles E. & Mary Jane Spahr Professor</i> , Department of Mechanical Engineering, University of Kansas
1996-2012	Professor, Department of Mechanical Engineering, University of Connecticut (<i>Distinguished Engineering Professor</i> , three year appointment, 1999-2001; <i>Pratt & Whitney Professor of Mechanical Engineering</i> , three year appointment, 1996-1999).
1990-1996	<i>Myron L. Begeman</i> Associate Professor of Mechanical Engineering, The University of Texas at Austin (promoted to full professor in 1996)
1985-1990	Assistant Professor of Mechanical Engineering, The University of Texas at Austin
1980-1985	Graduate Research Assistant, Purdue University
1978-1980	Design Engineer, Black & Veatch, Overland Park, KS

IIIb. Administrative Positions

2012-2017	Chair, Department of Mechanical Engineering, University of Kansas
2008-2010	Director, Thermal Transport Processes Program, U.S. National Science Foundation Directorate for Engineering
2004-2006	Associate Dean for Research & Outreach, School of Engineering, University of Connecticut
1998-2004	Head, Department of Mechanical Engineering, University of Connecticut

(Various interim appointments in academia and at NSF are described in Part Two beginning on page 27.)

PART ONE: Scholarship, Service, and Teaching

**(see pages 27 – 32 for Administrative Achievements in Academia
and at the U.S. National Science Foundation)**

IV. Scholarly Interests

- Transport phenomena in energy systems including:
 - Dry cooling for electric power generation
 - Thermal energy storage for concentrating solar power
- Heat and mass transfer including:
 - Two-phase flow in heat pipes and thermosyphons
 - Thermal processing of powders including additive manufacturing
 - Thermal spraying of nanostructured coatings
- Fundamental convection phenomena including:
 - Mixed and double-diffusive convection
 - Convection with solid-liquid phase change

V. Awards, Honors, Recognition and Memberships

- National and International*
- U.S. National Science Foundation, *Certificate of Appreciation* (for service as Director of the Thermal Transport Processes Program), 2010
 - Member, Scientific Council, *International Centre for Heat and Mass Transfer*, 2010 - present
 - Editorial Board, *Frontiers in Heat and Mass Transfer*, 2010 - present
 - ASME Heat Transfer Division *Certificate of Appreciation* (for service as Technical Program Chair, 2001 ASME/AICHE/AIAA/ANS National Heat Transfer Conference), 2003
 - ASME Heat Transfer Division *Certificate of Appreciation* (for service as Associate Editor of the *ASME Journal of Heat Transfer*), 1998
 - *Fellow* of ASME, 1995
 - *ASME Journal of Heat Transfer*, Associate Technical Editor, 1995-1998
 - Member, U.S. Scientific Committee, *11th International Heat Transfer Conference*, Kyongju, Korea, 1997-1998
 - Member and Secretary, U.S. Scientific Committee, *10th International Heat Transfer Conference*, Brighton, U.K., 1993-1994
 - ASME Heat Transfer Division, *Outstanding Reviewer, Journal of Heat Transfer*, 1992 - 1993 (this was one of the inaugural awards)
 - ASME *Melville Medal*, 1988 (the highest ASME honor for an original paper which has been published in any ASME Transactions journal during the two calendar years immediately preceding the year of the award)
 - U.S. National Science Foundation, *Presidential Young Investigator*, 1986
 - ASME, Heat Transfer Division *Best Paper Award*, 1986

- State* • Member, *Connecticut Academy of Science and Technology*, 2003-2012;
Communicating Member, 2012-present.
- Local* • University of Kansas School of Engineering, *Miller Professional Development Award* (for distinguished service to the engineering profession), 2018.
• University of Kansas, *Charles E. & Mary Jane Spahr Professorship*, 2012-present
• University of Connecticut, *Distinguished Engineering Professorship*, 1999-2001
• University of Connecticut, *Outstanding Faculty Award*, School of Engineering, 1999
• University of Connecticut, *Olin Faculty Fellow*, twice, in 1997 and 2001
• University of Connecticut, *Pratt & Whitney Professorship*, 1996-1998
• U.T. Austin, *Halliburton Education Foundation Award of Excellence* (in recognition of outstanding achievement and professionalism in education, research, and service to students), 1990
• U.T. Austin, *M.E. Department Excellence in Teaching Award*, 1989
• U.T. Austin, *Engineering Teaching Fellow in Engineering*, 1987-1989
• U.T. Austin, *Engineering Foundation Faculty Leadership Award*, College of Engineering, twice, in 1987 and 1990
- Member* American Society of Mechanical Engineers (Fellow), American Society of Engineering Educators, American Association for the Advancement of Science, Connecticut Academy of Science and Engineering, International Centre for Heat and Mass Transfer, Sigma Xi, Tau Beta Pi, Pi Tau Sigma.
- Listings* American Men and Women of Science, Marquis Who's Who in America, Google Scholar (18th highest number of citations in mechanical engineering, worldwide), Google Scholar (2nd highest number of citations over all disciplines, University of Kansas main campus)

VI. Publications

Books:

Various editions of the following books have been cited over 30,000 times, according to Google Scholar. Recent editions have been translated to Chinese, Greek, Korean, Portuguese, Spanish, and Turkish.

T.L. Bergman and A.S. Lavine, *Fundamentals of Heat and Mass Transfer*, 8th edition, John Wiley & Sons, Hoboken, N.J., ISBN 978-1-119-32042-5, 2017.

F.P. Incropera, D.P. DeWitt, T.L. Bergman, A.S. Lavine, *Principles of Heat and Mass Transfer*, 7th edition, John Wiley & Sons, Hoboken, N.J. ISBN: 978-0-470-64615-1, 2013.

F.P. Incropera, D.P. DeWitt, T.L. Bergman, A.S. Lavine, *Foundations of Heat Transfer*, 6th edition, John Wiley & Sons, Hoboken, N.J. ISBN: 978-0-470-64616-1, 2013.

T.L. Bergman, A.S. Lavine, F.P. Incropera and D.P. DeWitt, *Fundamentals of Heat and Mass Transfer*, 7th edition, John Wiley & Sons, Hoboken, N.J. ISBN: 978-0470-50197-9, 2011.

T.L. Bergman, A.S. Lavine, F.P. Incropera and D.P. DeWitt, *Introduction to Heat Transfer*, 6th edition, John Wiley & Sons, Hoboken, N.J. ISBN: 978-0470-50196-2, 2011.

F.P. Incropera, D.P. DeWitt, T.L. Bergman and A.S. Lavine, *Fundamentals of Heat and Mass Transfer*, 6th edition, John Wiley & Sons, Hoboken, N.J., ISBN: 0-471-45728-2, 2007.

F.P. Incropera, D.P. DeWitt, T.L. Bergman and A.S. Lavine, *Introduction to Heat Transfer*, 5th edition, John Wiley & Sons, Hoboken, N.J., ISBN: 978-0-471-45727-5, 2007.

Refereed Journal Articles:

96. T.L. Bergman, “Active Daytime Radiative Cooling using Spectrally Selective Surfaces for Air Conditioning and Refrigeration Systems,” *Solar Energy*, vol. 174, pp. 16-23, 2018.

95. J.R. Stark, C.D. Severt and T.L. Bergman, “Experimentally Validated Analytical Expressions for the Thermal Resistance of a Novel Composite Fin-Foam Annular Array,” *Applied Thermal Engineering*, vol. 131, pp. 260-269, 2018.

94. J.R. Stark, R. Prasad and T.L. Bergman, “Experimentally Validated Analytical Expressions for the Thermal Efficiencies and Thermal Resistances of Porous Metal Foam-Fins,” *International Journal of Heat and Mass Transfer*, vol. 111, pp. 1286-1295, 2017.

93. J.R. Stark and T.L. Bergman, “Prediction of Convection from a Finned Cylinder in Cross Flow using Direct Simulation, Turbulence Modeling, and Correlation-Based Methods,” *Numerical Heat Transfer-Applications*, vol. 71, pp. 591-608, 2017.

92. L.M. Poplaski, A. Faghri and T.L. Bergman, “Analysis of Internal and External Thermal Resistances of Heat Pipes Including Fins Using a Three-Dimensional Numerical Simulation,” *International Journal of Heat and Mass Transfer*, vol. 102, pp. 455 – 469, 2016.

91. N. Sharifi, J.R. Stark, T.L. Bergman and A. Faghri, “The Influence of Thermal Contact Resistance on the Relative Performance of Heat Pipe-Fin Array Systems,” *Applied Thermal Engineering*, vol. 105, pp. 46-55, 2016.

90. S.P. Benn, L.M. Poplaski, A. Faghri and T.L. Bergman, “Analysis of Thermosyphon/Heat Pipe Integration for Feasibility of Dry Cooling for Thermoelectric Power Generation,” *Applied Thermal Engineering*, vol. 104, pp. 358-374, 2016.

89. J.R. Stark, N. Sharifi, T.L. Bergman and A. Faghri, “An Experimentally Verified Numerical Model of Finned Heat Pipes in Crossflow,” *International Journal of Heat and Mass Transfer*, vol. 97, pp. 45-55, 2016.

- 88*. H. Shabgard, M.J. Allen, N. Sharifi, S.P. Benn, A. Faghri and T.L. Bergman, "Heat Pipe Heat Exchangers and Heat Sinks: Opportunities, Challenges, Applications, Analysis, and State of the Art," *International Journal of Heat and Mass Transfer*, vol. 89, pp. 138-158, 2015.
87. M.J. Allen, N. Sharifi, T.L. Bergman and A. Faghri, "Robust Heat Transfer Enhancement during Melting and Solidification of a PCM using a Combined Heat Pipe-Metal Foam or Foil Configuration," *ASME Journal of Heat Transfer*, vol. 137, pp. 102301-1 to 102301- 11, 2015.
86. M.J. Allen, N. Sharifi, A. Faghri and T.L. Bergman, "Effect of Inclination during Melting and Solidification of a Phase Change Material Using Combined Heat Pipe-Metal Foam and Heat Pipe-Foil Configurations," *International Journal of Heat and Mass Transfer*, vol. 80, pp. 767-780, 2015.
85. N. Sharifi, A. Faghri, T.L. Bergman and C.E. Andraka, "Simulation of Heat Pipe-Assisted Latent Heat Thermal Energy Storage with Simultaneous Charging and Discharging," *International Journal of Heat and Mass Transfer*, vol. 80, pp. 170-179, 2015.
84. N. Sharifi, T.L. Bergman, M.J. Allen and A. Faghri, "Melting and Solidification Enhancement using a Combined Heat Pipe, Foil Approach," *International Journal of Heat and Mass Transfer*, vol. 78, pp. 930-941, 2014.
83. H. Shabgard, A. Faghri, T.L. Bergman and C.E. Andraka, "Numerical Simulation of Heat Pipe-Assisted Latent Thermal Energy Storage Unit for Dish-Stirling Systems," *ASME Journal of Solar Energy Engineering*, vol. 136, pp. 021025-1 to 021025-12, 2014.
82. H. Shabgard, T.L. Bergman and A. Faghri, "Exergy Analysis of Latent Heat Thermal Energy Storage for Solar Power Generation Accounting for Constraints Imposed by Long-Term Operation and the Solar Day," *Energy*, vol. 60, pp. 474-484, 2013.
81. N. Sharifi, C.W. Robak, T.L. Bergman and A. Faghri, "Three-Dimensional PCM Melting in a Vertical Cylindrical Enclosure Including the Effects of Tilting," *International Journal of Heat and Mass Transfer*, vol. 65, pp. 798-806, 2013.
80. H. Bahrami, T.L. Bergman and A. Faghri, "Forced Convection Heat Transfer in a Microtube including Rarefaction, Viscous Dissipation and Axial Conduction Effects," *International Journal of Heat and Mass Transfer*, vol. 55, pp. 6665-6675, 2012.
79. J. Cho, Y. Zhu, K. Lewkowicz, S.-H. Lee, T. Bergman and B. Chaudhari, "Solving Granular Segregation Problems using a Biaxial Rotary Mixer," *Chemical Engineering and Processing: Process Intensification*, vol. 57-58, pp. 42-50, 2012.
78. S. Wang, A. Faghri and T.L. Bergman, "Melting in Cylindrical Enclosures: Numerical Modeling and Heat Transfer Correlations," *Numerical Heat Transfer-Applications*, vol. 61, pp. 837-859, 2012.

77. S. Wang, A. Faghri and T.L. Bergman, "A Comparison Study of Sensible and Latent Thermal Energy Storage Systems for Concentrating Solar Power Applications," *Numerical Heat Transfer-Applications*, vol. 61, pp. 860-871, 2012.

76. S. Wang, A. Faghri and T.L. Bergman, "Transient Natural Convection in Vertical Annuli: Numerical Modeling and Heat Transfer Correlation," *Numerical Heat Transfer-Applications*, vol. 61, pp. 823-836, 2012.

75. N. Sharifi, S. Wang, T.L. Bergman and A. Faghri, "Heat Pipe-Assisted Melting of a Phase Change Material," *International Journal of Heat and Mass Transfer*, vol. 55, pp. 3458-3469, 2012.

74. H. Shabgard, C.W. Robak, T.L. Bergman and A. Faghri, "Heat Transfer and Exergy Analysis of Cascaded Latent Heat Storage with Gravity-Assisted Heat Pipes for Concentrating Solar Power Applications," *Solar Energy*, vol. 86, pp. 816-830, 2012.

73. C.W. Robak, T.L. Bergman and A. Faghri, "Economic Evaluation of Latent Heat Thermal Energy Storage Using Embedded Thermosyphons or Heat Pipes for Concentrating Solar Power Applications," *Solar Energy*, vol. 85, pp. 2461-2473, 2011.

72. N. Sharifi, T.L. Bergman and A. Faghri, "Enhancement of PCM Melting in Enclosures with Horizontally-Finned Internal Surfaces," *International Journal of Heat and Mass Transfer*, vol. 54, pp. 4182-4192, 2011.

71. C.W. Robak, T.L. Bergman and A. Faghri, "Enhancement of Latent Heat Energy Storage Unit using Embedded Heat Pipes," *International Journal of Heat and Mass Transfer*, vol. 54, pp. 3476-3484, 2011.

70. K. Greco, T.L. Bergman and R. Bogner, "Design and Characterization of a Laminar Flow-Through Dissolution Apparatus: Comparison of Hydrodynamic Conditions to those of Common Dissolution Technique," *Pharmaceutical Development and Technology*, vol. 16, pp. 75-87, 2011.

69. S. Wang, A. Faghri and T.L. Bergman "Numerical Modeling of Alternate Melting and Solidification," *Numerical Heat Transfer – Fundamentals*, vol. 58, pp. 393-418, 2010.

68**. H. Shabgard, T.L. Bergman, N. Sharifi and A. Faghri, "High Temperature Latent Heat Thermal Energy Storage using Heat Pipes," *International Journal of Heat and Mass Transfer*, vol. 53, pp. 2979-2988, 2010.

67. S.S. Manickam, R. Shah, J. Tomei, T.L. Bergman and B. Chaudhuri, "Investigating Mixing in a Multi-Dimensional Rotary Mixer: Experiments and Simulations," *Powder Technology*, vol. 201, pp. 83-92, 2010.

66. S. Wang, A. Faghri, and T.L. Bergman, "A Comprehensive Model for Melting with Natural Convection," *International Journal of Heat and Mass Transfer*, vol. 53, pp. 1986-2000, 2010.

65. T.L. Bergman, "Analysis of Heat Transfer Enhancement in Minichannel Heat Sinks with Turbulent Flow using $H_2O-Al_2O_3$ Nanofluids," *ASME Journal of Electronic Packaging*, vol. 131, pp. 021008-1 to 021008-5, 2009.
64. T.L. Bergman, "Effect of Reduced Specific Heats of Nanofluids on Single Phase, Laminar Internal Forced Convection," *International Journal of Heat and Mass Transfer*, vol. 52, pp. 1240-1244, 2009.
63. N. Fekrazad and T.L. Bergman, "Effect of Non-Uniform Stack Compression on Proton Exchange Membrane Fuel Cell Behavior," *ASME Journal of Heat Transfer*, vol. 130, pp. 122002-1 to 122002-7, 2008.
62. A.S. Lavine and T.L. Bergman, "Small and Large Time Solutions for Surface Temperature, Surface Heat Flux, and Energy Input in Transient, One-Dimensional Conduction in Simple Geometries," *ASME Journal of Heat Transfer*, vol. 130, pp. 101302-1 to 101302-8, 2008.
61. T.L. Bergman, "Extreme Mid-Plane Wall Temperatures due to Sequential Heating and Cooling," *ASME Journal of Heat Transfer*, vol. 130, pp. 094503-1 to 094503-4, 2008.
- 60***. T.L. Bergman, A. Faghri and R. Viskanta, "Frontiers in Transport Phenomena Research and Education: Energy Systems, Biological Systems, Security, Information Technology and Nanotechnology," *International Journal of Heat and Mass Transfer*, vol. 51, pp. 4599-4613, 2008.
59. N. Fekrazad and T.L. Bergman, "Bipolar Plate Thermal Response to PEM Fuel Cell Stack Compressive Load," *ASME Journal of Heat Transfer*, vol. 130, pp. 064503-1 to 064503-3, 2008.
58. N. Fekrazad and T.L. Bergman, "The Effect of Compressive Load on Proton Exchange Membrane Fuel Cell Stack Performance and Behavior," *ASME Journal of Heat Transfer*, vol. 129, pp. 1004-1013, 2007.
57. I. Ahmed and T.L. Bergman, "Optimization of Plasma Spray Processing Parameters for Deposition of Nanostructured Coatings," *ASME Journal of Fluids Engineering*, vol. 128, pp. 394-401, 2006.
56. S. Roychoudhary and T.L. Bergman, "Response of Agglomerated, Multi-Ceramic Particles to Intense Heating and Cooling for Thermal Plasma Spraying Simulation," *Numerical Heat Transfer - Applications*, vol. 45, pp. 211-233, 2004.
55. J. Lee and T.L. Bergman, "Scaling Analysis and Prediction of the Thermal Plasma Spraying Process using a Discrete Particle Approach," *Journal of Thermal Spray Technology*, vol. 11, pp. 179-185, 2002.
54. R.M. Tarafdar and T.L. Bergman, "Detailed Numerical and Experimental Investigation of Non-Isothermal Sintering of Amorphous Polymer Material," *ASME Journal of Heat Transfer*, vol. 124, pp. 553-563, 2002.

53. I. Ahmed and T.L. Bergman, "An Engineering Model for Solid-Liquid Phase Change within Sprayed Ceramic Coatings of Non-Uniform Thickness," *Numerical Heat Transfer - Applications*, vol. 41, pp. 113-129, 2002.
52. C.W. Buckley and T.L. Bergman, "Experimental Investigation of Laser-Induced Melting and Re-Solidification of Two-Component Metal Powders," *ASME Journal of Heat Transfer*, vol. 123, pp. 586-592, 2001.
51. I. Ahmed and T.L. Bergman, "Simulation of Thermal Plasma Spraying of Partially Molten Ceramics: Effect of Carrier Gas on Particle Deposition and Phase Change Phenomena," *ASME Journal of Heat Transfer*, vol. 123, pp. 188-196, 2001.
50. M. Kandis and T.L. Bergman, "A Simulation-Based Correlation of the Effective Thermal Conductivity and Porosity of Objects Produced by Laser-Induced Sintering of Polymer Powders," *ASME Journal of Manufacturing Science and Engineering*, vol. 122, pp. 439-444, 2000.
49. I. Ahmed and T. L. Bergman, "Three-Dimensional Simulation of Thermal Plasma Spraying of Partially Molten Ceramic Agglomerates," *Journal of Thermal Spray Technology*, vol. 9, pp. 215-224, 2000.
48. Y. Zhang, A. Faghri, C.W. Buckley and T.L. Bergman, "Three Dimensional Sintering of Two-Component Metal Powders with Stationary and Moving Laser Beams," *ASME Journal of Heat Transfer*, vol. 122, pp. 150-158, 2000.
47. D.A. Hall, G.C. Vliet and T.L. Bergman, "Natural Convection Cooling of Vertical Rectangular Channels in Air Considering Radiation and Wall Conduction," *ASME Journal of Electronic Packaging*, vol. 121, pp. 75-84, 1999.
46. M. Kandis, C.W. Buckley and T.L. Bergman, "An Engineering Model for Laser-Induced Sintering of Polymer Powders," *ASME Journal of Manufacturing Science and Engineering*, vol. 121, pp. 360-365, 1999.
45. I. Ahmed and T.L. Bergman, "Thermal Modeling of Plasma Spray Deposition of Nanostructured Ceramics," *Journal of Thermal Spray Technology*, vol. 8, pp. 315-322, 1999.
44. M. Song, K.S. Ball and T.L. Bergman, "A Model for Radiative Cooling of a Semitransparent Molten Glass Jet," *ASME Journal of Heat Transfer*, vol. 120, pp. 931-938, 1998.
43. K.S. Ball, M. Song, M. Gomon, M.W. Silva, E.M. Taleff, B.M. Powers and T.L. Bergman, "Canister Filling with a Molten Glass Jet," *ASME Journal of Heat Transfer*, vol. 119, p. 204, 1997.
42. M. Kandis and T.L. Bergman, "Observation, Prediction and Correlation of Geometric Shape Evolution Induced by Non-Isothermal Sintering of Polymer Powder," *ASME Journal of Heat Transfer*, vol. 119, pp. 824-831, 1997.

41. J.H. Moh, T.L. Bergman and D.C. Kuo, "Simulation of Two-Dimensional, Low Pr Natural Convection within Harmonically-Oscillated, Differentially-Heated Enclosures," *Numerical Heat Transfer - Applications*, vol. 31, pp. 1-19, 1997.
40. T.E. Voth and T.L. Bergman, "Ball Grid Array Thermomechanical Response during Reflow Assembly," *ASME Journal of Electronic Packaging*, vol. 118, pp. 214-222, 1996.
39. T.L. Bergman and M.T. Hyun, "Simulation of Two-Dimensional Thermosolutal Convection in Liquid Metals Induced by Horizontal Temperature and Species Gradients," *International Journal of Heat and Mass Transfer*, vol. 39, pp. 2883-2894, 1996.
38. S. Mittal, G.Y. Masada and T.L. Bergman, "Mechanical Response of PCB Assemblies During Infrared Reflow Soldering," *IEEE Transactions on Components, Packaging and Manufacturing Technology Part A*, vol. 19, pp. 127-133, 1996.
37. R.W. Hill and T.L. Bergman, "Non-Newtonian Flow and Heat Transfer in an Obstructed Channel with Applied Radio-Frequency Heating," *ASME Journal of Heat Transfer*, vol. 117, pp. 889-894, 1996, (see also Refereed Conference Proceeding #13).
36. Y.S. Son, M.T. Hyun and T.L. Bergman, "Simulation of Heat Transfer in a Reflow Oven with Air and Nitrogen Injection," *ASME Journal of Electronic Packaging*, vol. 117, pp. 317-322, 1995, (see also Refereed Conference Proceeding #22).
35. T.L. Bergman and Y.S. Son, "Mixed Convection in Horizontal Channels with Discrete Material and Top Exhaust," *International Journal of Heat and Mass Transfer*, vol. 38, pp. 2519-2527, 1995.
34. T.H. Paul and T.L. Bergman, "Polarigraphic Measurement of Liquid Phase Species Distributions," *Experimental Thermal and Fluid Science*, vol. 10, pp. 519-524, 1995 (see also Refereed Conference Proceeding #9).
33. M.T. Hyun and T.L. Bergman, "Direct Simulation of Double-Diffusive Layered Convection," *ASME Journal of Heat Transfer*, vol. 117, pp. 334-339, 1995.
32. M.T. Hyun, D.C. Kuo, T.L. Bergman and K.S. Ball, "Direct Simulation of Double Diffusive Convection in Low Pr Liquids," *Numerical Heat Transfer-Applications*, vol. 27, pp. 639-650, 1995.
31. M.A. Eftychiou, T.L. Bergman and G.Y. Masada, "A Detailed Thermal Model of the Infrared Solder Reflow Process," *ASME Journal of Electronic Packaging*, vol. 115, pp. 55-62, 1993.
30. A. Liu, T.E. Voth and T.L. Bergman, "Melting and Solidification of Pure Materials with Liquid Phase Buoyancy and Surface Tension Forces," *International Journal of Heat and Mass Transfer*, vol. 36, pp. 411-422, 1993.
29. T.E. Voth, A. Liu and T.L. Bergman, "Thermocapillary Convection During Solid-Liquid Phase Change," *ASME Journal of Heat Transfer*, vol. 114, pp. 1068-1070, 1992.

28. N.J. Fernandes, T.L. Bergman and G.Y. Masada, "Thermal Effects during Infrared Solder Reflow I: Heat Transfer Mechanisms," *ASME Journal of Electronic Packaging*, vol. 114, pp. 41-47, 1992.
27. M.A. Eftychiou, T.L. Bergman and G.Y. Masada, "Thermal Effects during Infrared Solder Reflow II: A Model of the Reflow Process," *ASME Journal of Electronic Packaging*, vol. 114, pp. 48-54, 1992.
26. B.W. Webb and T.L. Bergman, "Three-Dimensional Natural Convection from Vertical Heated Plates with Adjoining Cool Surfaces," *ASME Journal of Heat Transfer*, vol. 114, pp. 115-120, 1992.
25. J.L. Grolmes and T.L. Bergman, "Dielectrically-Assisted Drying of Non-Hygroscopic Transparent Porous Beds," *Drying Technology*, vol. 8, pp. 953-975, 1990.
24. J.G. Petri and T.L. Bergman, "Augmentation of Natural Convection Heat Transfer using Binary Gas Coolants," *International Journal of Heat and Mass Transfer*, vol. 33, pp. 1441-1450, 1990.
23. J.R. Keller and T.L. Bergman, "Thermocapillary Cavity Convection in Wetting and Non-Wetting Liquids," *Numerical Heat Transfer-Applications*, vol. 18, pp. 33-49, 1990.
22. J.R. Keller and T.L. Bergman, "Thermosolutal Inducement of No-Slip Boundary Conditions in Combined Thermocapillary-Buoyancy Cavity Flows," *ASME Journal of Heat Transfer*, vol. 112, pp. 363-369, 1990.
21. T.L. Bergman and T.S. Labiosa, "Forced-Convection Heat and Mass Transfer from Complex Surfaces," *Experimental Heat Transfer*, vol. 3, pp. 83-100, 1990.
20. T.L. Bergman and B.W. Webb, "Simulation of Pure Metal Melting with Buoyancy and Surface Tension Forces in the Liquid Phase," *International Journal of Heat and Mass Transfer*, vol. 33, pp. 139-150, 1990.
19. J.R. Keller and T.L. Bergman, "Prediction of Conjugate Heat Transfer in a Solid-Liquid System: Inclusion of Buoyancy and Surface Tension Forces in the Liquid Phase," *ASME Journal of Heat Transfer*, vol. 111, pp. 690-698, 1989.
18. T.L. Bergman and R. Srinivasan, "Numerical Simulation of Soret-Induced Double-Diffusion in an Initially Uniform Concentration Binary Liquid," *International Journal of Heat and Mass Transfer*, vol. 32, pp. 679-687, 1989.
17. T.L. Bergman and A. Ungan, "A Note on Lateral Heating in a Double-Diffusive System," *Journal of Fluid Mechanics*, vol. 194, pp. 175-186, 1988.
16. T.L. Bergman and J.R. Keller, "Combined Buoyancy, Surface Tension Flow in Liquid Metals," *Numerical Heat Transfer*, vol. 13, pp. 49-63, 1988.

15. T.L. Bergman, A. Urgan, F.P. Incropera and R. Viskanta, "Mixed Layer Development in a Salt-Stratified Solution Destabilized by a Discrete Heat Source," *ASME Journal of Heat Transfer*, vol. 109, pp. 802-803, 1987.
14. T.L. Bergman, F.P. Incropera and R. Viskanta, "Interaction of External and Double-Diffusive Convection in Linearly Salt-Stratified Systems," *Experiments in Fluids*, vol. 5, pp. 49-58, 1987.
13. T.L. Bergman and F. Cosenza, "A Fiber-Optic Refractometer for Species Concentration Measurement in a Microwave Environment," *Journal of Microwave Power and Electromagnetic Energy*, vol. 22, pp. 181-183, 1987.
12. T.L. Bergman, D.R. Munoz, F.P. Incropera and R. Viskanta, "Measurement of Salinity Distributions in Salt-Stratified, Double-Diffusive Systems by Optical Deflectometry," *Review of Scientific Instruments*, vol. 57, pp. 2538-2542, 1986.
11. T.L. Bergman and A. Urgan, "Experimental and Numerical Investigation of Double-Diffusive Convection Induced by a Discrete Heat Source," *International Journal of Heat and Mass Transfer*, vol. 29, pp. 1695-1709, 1986.
10. T.L. Bergman, "Numerical Simulation of Double-Diffusive Marangoni Convection," *Physics of Fluids*, vol. 29, pp. 2103-2108, 1986.
9. T.L. Bergman, F.P. Incropera and R. Viskanta, "Transient Behavior of a Radiatively Heated Double-Diffusive System," *ASME Journal of Heat Transfer*, vol. 108, pp. 317-322, 1986.
8. T.L. Bergman and S. Ramadhyani, "Combined Buoyancy, Thermocapillary Driven Convection in Open, Square Cavities," *Numerical Heat Transfer*, vol. 9, pp. 441-451, 1986.
7. T.L. Bergman, F.P. Incropera and R. Viskanta, "Correlation of Mixed Layer Growth in a Double-Diffusive Salt-Stratified System Heated from Below," *ASME Journal of Heat Transfer*, vol. 108, pp. 206-211, 1986.
6. T.L. Bergman, F.P. Incropera and R. Viskanta, "Parameterization of System Behavior for Salt-Stratified Solutions Heated from Below With and Without Salinity-Maintained Mixed Layers," *International Journal of Heat and Mass Transfer*, vol. 28, pp. 1617-1621, 1985.
5. T.L. Bergman, F.P. Incropera and R. Viskanta, "A Differential Model for Salt-Stratified, Double-Diffusive Systems Heated from Below," *International Journal of Heat and Mass Transfer*, vol. 28, pp. 779-788, 1985.
4. T.L. Bergman, F.P. Incropera and W.H. Stevenson, "Miniature Fiber-Optic Refractometer for Measurement of Salinity in Double-Diffusive Thermohaline Systems," *Review of Scientific Instruments*, vol. 56, pp. 291-296, 1985.
3. T.L. Bergman, W.G. Houf and F.P. Incropera, "Effect of Single Scatter Phase Function Distribution on Radiative Transfer in Absorbing-Scattering Liquids," *International Journal of Heat and Mass Transfer*, vol. 26, pp. 101-107, 1985.

2. T.L. Bergman, F.P. Incropera and R. Viskanta, "A Multi-Layer Model for Mixing Layer Development in a Double-Diffusive Thermohaline System Heated from Below," *International Journal of Heat and Mass Transfer*, vol. 25, pp. 1411-1418, 1982.

1. T. Bergman and R. Mesler, "Bubble Nucleation Studies Part 1: Formation of Bubble Nuclei in Superheated Water by Bursting Bubbles," *AIChE Journal*, vol. 27, pp. 851-853, 1981.

**Ranked No. 1 among the "Top 25 Hottest Articles" by the International Journal of Heat and Mass Transfer. This ranking is based on the number of internet downloads between July and September of 2015 of all articles published in IJHMT over more than five decades.*

***Ranked No. 12 among the "Top 25 Hottest Articles" by the International Journal of Heat and Mass Transfer from April to June, 2010.*

****Ranked No. 7 among the "Top 25 Hottest Articles" by the International Journal of Heat and Mass Transfer from July to September, 2008.*

Refereed Conference Proceedings Papers:

38. M.J. Allen, A. Faghri, T.L. Bergman, "Robust Heat Transfer Enhancement During Melting and Solidification of a PCM using a Combined Heat Pipe-Metal Foam or Foil Configuration," ES-FuelCell2014-6324, *Proceedings of the ASME 2014 8th International Conference on Energy Sustainability*, 12 pages, Boston, MA, 2014.

37. H. Shabgard, A. Faghri, T.L. Bergman and C.E. Andraka, "Numerical Simulation of Heat-Pipe-Assisted Latent Heat Thermal Energy Storage Unit for Dish-Stirling Systems," IMECE2013-65487, *Proceedings of the 2013 ASME International Mechanical Engineering Congress & Exposition*, 16 pages, San Diego, CA, 2013.

36. R. Shah, S. Manickam, J. Tomei, T.L. Bergman and B. Chaudhuri, "Mixing Study in a Multidimensional Motion Mixer," *Powders and Grains 2009, AIP Conference Proceedings*, vol. 6, pp. 683-686, 2009.

35. N. Fekrazad and T.L. Bergman, "Effect of Non-Uniform Clamping Pressure on PEM Fuel Cell Stack Performance," *Proceedings of the 2007 ASME-JSME Thermal Engineering Conference and Summer Heat Transfer Conference*, HT2007-32076, 9 pages, Vancouver, BC, Canada, 2007.

34. N. Fekrazad and T.L. Bergman, "Effect of Clamping Pressure on PEM Fuel Cell Stack Performance," *Proceedings of the 2005 ASME International Mechanical Engineering Congress and Exposition*, 13 pages, IMECE2005-81944, Orlando, FL 2005 (CD Rom).

33. D.W. Rosen, C. Atwood, J. Beaman, D., Bourell, T., Bergman and S. Hollister, "Results of WTEC Additive/Subtractive Manufacturing Study of European Research," *Proceedings of the SME Rapid Prototyping & Manufacturing Conference*, Paper No. TP04PUB211, Dearborn, MI, May 10-13, 2004.

32. I. Ahmed and T.L. Bergman, "Optimization of Plasma Spray Processing Parameters for Deposition of Nanostructured Coatings," *Proceedings of the 2002 ASME International Mechanical Engineering Congress and Exposition, IMECE 2002-33944*, New Orleans, LA, 2002 (CD Rom).
31. S. Roychoudhary and T.L. Bergman, "Predicted Response of Multi-Ceramic Particles to Rapid Heating and Cooling," *Proceedings of the 12th International Heat Transfer Conference*, Grenoble, 2002 (CD Rom).
30. I. Ahmed and T.L. Bergman, "CFD Simulation of Thermal Plasma Spraying of Partially Molten Ceramics: Effect of Carrier Gas on Particle Deposition and Phase Change Phenomena," *Proceedings of the Heat Transfer Division, 2000 ASME International Mechanical Engineering Congress and Exposition*, edited by J.H. Kim, HTD-Vol. 366-3, pp. 407-417, 2000.
29. I. Ahmed and T. L. Bergman, "Computational Simulation of Thermal Plasma Spraying of Ceramics: Effects of Carrier Gas and Particle Loading," presented at the *2nd United Engineering Foundation Conference on Thermal Spray Processing of Nanoscale Materials*, Quebec City, Aug. 15-20, 1999.
28. Y. Zhang, A. Faghri, C.W. Buckley and T.L. Bergman, "3-D Sintering of Two Component Metal Powders with Stationary and Moving Laser Beams," *Proceedings of the ASME Heat Transfer Division - 1999*, HTD-Vol. 364-3, pp. 211-223, 1999.
27. M. Kandis, C.W. Buckley and T.L. Bergman, "A Model for Polymer Powder Sintering Induced by Laser Irradiation," *Heat Transfer 1998: Proceedings of the 11th International Heat Transfer Conference*, Kyongju, edited by J.S. Lee et al., vol. 5, pp. 205-210, 1998.
26. K.S. Ball, M. Song and T.L. Bergman, "A Model for Radiative and Convective Cooling of a Semitransparent Molten Glass Jet," *Proceedings of the 1997 National Heat Transfer Conference*, edited by T.L. Bergman et al., HTD-Vol. 347, pp. 231-240, 1997.
25. J.L. Norrell, K.L. Wood, R.H. Crawford and T.L. Bergman, "Forced Convection in Polymeric Powders," *Solid Freeform Fabrication Symposium*, edited by D.L. Bourell et al., The University of Texas at Austin, pp. 459-470, 1996.
24. J.L. Norrell, M. Kandis and T.L. Bergman, "The Influence of Natural Convection and Radiation Heat Transfer on Sintering of Polycarbonate Powders," *Solid Freeform Fabrication Symposium*, edited by D.L. Bourell et al., The University of Texas at Austin, pp. 619-627, 1996.
23. M. Kandis and T.L. Bergman, "Void Formation and Crack Propagation in Polymer Parts Grown by Non-Isothermal Sintering," *Proceedings of the 1996 National Heat Transfer Conference*, edited by V. Prasad et al., HTD-Vol. 323, pp. 199-206, 1996.
22. Y.S. Son, M.T. Hyun and T.L. Bergman, "Simulation of Forced Convection-Infrared Reflow Soldering with Nitrogen Injection," *Proceedings of the 1995 National Heat Transfer Conference*, edited by R.L. Mahajan, HTD-Vol. 306, pp. 211-218, 1995.

21. T.E. Voth and T.L. Bergman, "Thermomechanical Response of BGA Modules during Reflow Soldering," *Proceedings of the 1995 National Heat Transfer Conference*, edited by R.L. Mahajan, HTD-Vol. 306, pp. 233-240, 1995.
20. M.T. Hyun, D.C. Kuo, T.L. Bergman and K.S. Ball, "Simulation of Thermosolutal Convection in Pb-Sn: FVM and Spectral Predictions," *Proceedings of the 1995 National Heat Transfer Conference*, edited by R.L. Mahajan, HTD-Vol. 306, pp. 63-70, 1995.
19. J.A. Kasz and T.L. Bergman, "Buoyancy and Inertia Driven Flows in the Sliding Technique of LPE Crystal Growth," *Heat Transfer 1994: Proceedings of the 10th International Heat Transfer Conference*, edited by G.F. Hewitt, vol. 7, pp. 275-280, Brighton, 1994.
18. Y.S. Son and T.L. Bergman, "Continuous Infrared-Convective Processing of Discrete Opaque Material," *Heat Transfer 1994: Proceedings of the 10th International Heat Transfer Conference*, Brighton, edited by G.F. Hewitt, vol. 7, pp. 385-390, Brighton, 1994.
17. T.L. Bergman and K.S. Ball, "Transition to Oscillatory Convection in Low Pr Liquids Subject to a Horizontal Temperature Gradient," *Heat Transfer 1994: Proceedings of the 10th International Heat Transfer Conference*, edited by G.F. Hewitt, vol. 7, pp. 7-12, Brighton, 1994.
16. K.S. Ball and T.L. Bergman, "Numerical Simulation of Unsteady Low Pr Convection Using a Chebyshev Collocation Technique," *ASME Paper 93-WA/HT-43*, Winter Annual Meeting, New Orleans, 1993.
15. Y.S. Son, T.L. Bergman and G.Y. Masada, "Detailed Card Assembly Thermal Response during Infrared Reflow Soldering," in *Advances in Electronic Packaging*, edited by P.A. Engel and W.T. Chen, ASME, New York, vol. 4-2, pp. 575-581, 1993.
14. T.E. Voth, T.L. Bergman and G.Y. Masada, "Compressive Melting of Eutectic Pb-Sn Solder Spheres," in *Advances in Electronic Packaging*, edited by P.A. Engel and W.T. Chen, ASME, New York, vol. 4-2, pp. 1113-1118, 1993.
13. R.W. Hill and T.L. Bergman, "Simulation of Non-Newtonian Fluid Flow in an Obstructed Channel with Applied Electromagnetic Heating," in *Fundamentals of Heat Transfer in Electromagnetic, Electrostatic and Acoustic Fields*, edited by Y. Bayazitoglu and V.S. Arpaci, ASME HTD-Vol. 248, New York, pp. 1-7, 1993.
12. R.W. Hill, T.L. Bergman and J.A. Pearce, "Electromagnetic Augmentation of Thermoplastic Injection Mold Filling," in *Proceedings of the First International Conference on Transport Phenomena in Processing*, edited by S.I. Guceri, Technomic, Lancaster, pp. 1114-1125, 1992.
11. T.L. Bergman, M.A. Eftychiou and G.Y. Masada, "Thermal Processing of Discrete, Conveyorized Material," in *Heat Transfer in Materials Processing*, edited by J.C. Khanpara and P.J. Bishop, ASME HTD-Vol. 224, New York, pp. 27-34, 1992.

10. J.A. Kasz, T.L. Bergman, K.S. Ball and W.C. Chow, "Transient Mixed Convection Heat Transfer in Bottom Driven Cavities," in *Mixed Convection Heat Transfer*, edited by D.W. Pepper et al., ASME HTD-Vol. 163, New York, pp. 71-78, 1991.
9. T.H. Paul and T.L. Bergman, "Quantitative Measurement of Liquid Phase Species Concentrations using Optical Polarigraphy," *ASME Paper 91-HT-39*, National Heat Transfer Conference, Minneapolis, 1991.
8. J.R. Keller, T.L. Bergman and T.E. Voth, "The Influence of Surface Curvature in Mixed Thermocapillary-Buoyancy Cavity Flows," in *Mixed Convection and Environmental Flows*, edited by R.L. Mahajan et al., ASME HTD-Vol. 152 FED-Vol. 105, New York, pp. 47-54, 1990.
7. E.D. Olsson and T.L. Bergman, "Reduction of Numerical Fluctuations in Fixed Grid Solidification Simulations," in *Numerical Heat Transfer*, edited by K. Vafai and J.L.S. Chen, ASME HTD-Vol. 130, pp. 133-140, 1990.
6. T.L. Bergman and J.G. Petri, "Natural Convection Cooling of Discrete Heated Elements using Pressurized Helium-Xenon Gas Coolants," in *Natural and Mixed Convection in Electronic Equipment Cooling*, edited by R.A. Wirtz, ASME HTD Vol. 100, New York, pp. 25-33, 1988.
5. J.R. Keller and T.L. Bergman, "Prediction of Steady-State Convection in a Solid/Liquid System: Inclusion of Buoyancy and Surface Tension Effects in the Liquid Phase," *Proceedings of the 1988 National Heat Transfer Conference*, edited by H.R. Jacobs, ASME, vol. 3, pp. 101-108, 1988.
4. A. Ungan and T.L. Bergman, "A Two-Dimensional Numerical Simulation of a Linearly-Stratified Thermohaline System Heated From Below," *ASME Paper 87-WA/HT-19*, Winter Annual Meeting, Boston, 1987.
3. T.L. Bergman and A. Ungan, "An Experimental Investigation of a Double-Diffusive Layered Salt-Stratified System Destabilized by Lateral Heating and Cooling," *ASME Paper 87-WA/HT-22*, Winter Annual Meeting, Boston, 1987.
2. T.L. Bergman, P.S. Schmidt and T.A. Evans, "Experimental Studies of Dielectric/Convective Drying in Non-Hygroscopic Porous Beds," *Proceedings of the ASME-JSME Thermal Engineering Joint Conference*, edited by P.J. Marto and I. Tanasawa, vol. 1, pp. 571-578, 1987.
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9. A. Faghri and T.L. Bergman, "Reviews of Advances in Heat Pipe Analysis and Numerical Simulation," in *Numerical Simulation of Heat Exchangers: Advances in Numerical Heat Transfer*, Volume V, edited by W.J. Minkowycz, E.M. Sparrow, J.P. Abraham, and J.M. Gorman, Taylor & Francis Group, Boca Raton, pp. 173-212, 2017.

8. T.L. Bergman and D.L. Bourell, "Materials and Materials Processing," in *Additive/Subtractive Manufacturing Research and Development in Europe*, J.J. Beaman, C. Atwood, T.L. Bergman, D. Bourell, S. Hollister, and D. Rosen, World Technology Evaluation Center (WTEC), Baltimore, pp. 35-42, 2004.
7. S.J. Hollister and T.L. Bergman, "Biomedical Applications of Integrated Additive/Subtractive Manufacturing," in *Additive/Subtractive Manufacturing Research and Development in Europe*, J.J. Beaman, C. Atwood, T.L. Bergman, D. Bourell, S. Hollister, and D. Rosen, World Technology Evaluation Center (WTEC), Baltimore, pp. 55-62, 2004.
6. R. Viskanta and T.L. Bergman, "Heat Transfer in Materials Processing," *Handbook of Heat Transfer*, Third Edition, edited by W.M. Rohsenow, J.P. Hartnett, and Y.I. Cho, McGraw Hill Book Co., New York, 18.1-18.74, 1998.
5. T.L. Bergman and R. Viskanta, "Radiation Heat Transfer in Materials Processing and Manufacturing," *Radiative Transfer-I: Proceedings of the International Symposium on Radiative Heat Transfer*, edited by M.P. Mengüç, Begell House, Inc. New York, pp. 13-39, 1996.
4. J.R. Howell, K.S. Ball and T.L. Bergman, "Fundamentals and Applications of Radiative Heat Transfer: Implications for RTP," *RTP '94 Proceedings of the 2nd International Rapid Thermal Processing Conference*, edited by R.B. Fair and B. Lojek, RTP '94, pp. 9-13, 1994.
3. K.S. Ball and T.L. Bergman, "Molten Glass Jets," *McGraw-Hill 2001 Yearbook of Science and Technology*, McGraw-Hill, New York, pp. 260-262, 1993.
2. P.S. Schmidt, T.L. Bergman, J.A. Pearce and P. Chen, "Heat and Mass Transfer Considerations in Dielectrically-Enhanced Drying," *Drying, '92, International Drying Symposium Series*, edited by A.S. Majumdar, Part A, pp. 137-160, 1992.
1. R. Viskanta, T.L. Bergman and F.P. Incropera, "Double-Diffusive Natural Convection," in *Natural Convection: Fundamentals and Applications*, edited by S. Kakaç, W. Aung, and R. Viskanta, Hemisphere Publishing Corporation, Washington, D.C., pp. 1075-1099, 1985.

Other Publications and Technical Presentations:

11. T.L. Bergman, C.W. Robak, N. Sharifi, H. Shabgard and T.L. Bergman, "Review of Enhanced Latent Heat Thermal Energy Storage for Concentrating Solar Power Using Heat Pipes," *ASME 6th Conference on Energy Sustainability*, San Diego CA, July 23 - July 26, 2012 (abstract publication and presentation).
10. T.L. Bergman, A.S. Lavine, F.P. Incropera and D.P. DeWitt, *Solutions Manual, Fundamentals of Heat and Mass Transfer*, 7th edition, 2631 pages, John Wiley & Sons, 2011.
9. J. W. Fairbanks, C.T. Avedisian and T.L. Bergman, "The Department of Energy/National Science Foundation Partnership on Thermoelectric Devices for

Vehicle Applications,” *Materials Research Society 2010 MRS Fall Meeting*, Boston, MA, November 30 – December 3, 2010 (abstract publication and presentation).

8. F.P. Incropera, D.P. DeWitt, T.L. Bergman and A.S. Lavine, Solutions Manual, *Fundamentals of Heat and Mass Transfer*, 6th edition, 2325 pages, John Wiley & Sons, 2007.

7. I Ahmed, I. Sabirov, E. Jordan, T. Bergman and Y. Wu, “Inverse Calculation of Plasma Jet Impingement Heat Transfer,” *American Physical Society, Division of Fluid Dynamics, 56th Annual Meeting*, East Rutherford, N.J., 2003.

6. K. S. Ball, M. Song, M. Gomon, M. W. Silva, E. M. Taleff, B. M. Powers, and T. L. Bergman, “Canister Filling with a Molten Glass Jet,” *Bulletin of the American Physical Society*, vol. 41, p. 1749, 1996.

5. K.S. Ball, T.L. Bergman, E.M. Taleff, M. Song, M. Gomon, B.M. Powers, and M.W. Silva, “Canister Filling with a Molten Glass Jet,” presented at the *Heat Transfer Picture Gallery, 1996 International Mechanical Engineering Congress and Exposition*, Atlanta, GA, 1996.

4. T.L. Bergman and R. Viskanta, “Radiation Heat Transfer in Manufacturing and Materials Processing,” *Proceedings of the First International Symposium on Radiation Transfer*, Kusadasi, Turkey, August 13 - 18, 1995.

3. T.L. Bergman, “Simulation of Soldering of Electronics Assemblies,” Poster Presentation, *ASME Winter Annual Meeting*, New Orleans, LA, 1993.

2. J.L. Grolmes and T.L. Bergman, “Experimentally-Observed Thermal Characteristics During Microwave-Assisted Drying of Porous Materials,” *TIZ International Powder Magazine*, vol. 114, pp. 479-481, 1990 (also in *Mikrowellen & HF Magazin*), vol. 16, pp. 309-311, 1990.

1. P.S. Schmidt, T.L. Bergman, M.M. Crawford, M. Malek, J.A. Pearce and V.M. Torres, “Design and Qualification Testing of a 6 KW Microwave/Convective Drying Research System,” *22nd IMPI Microwave Symposium*, Cincinnati, OH, 1987.

Patent:

R.H. Bogner, T.L. Bergman, K. Greco, D.J. Michaels and S.J. Chawarski, “Flow-through Apparatus for Microscopic Investigation of Dissolution of Pharmaceutical Solids,” U.S. Patent 7,892,492, issued February 22, 2011.

VII. Research Supervision and Collaboration

Visiting Scholars and Post-Doctoral Students:

Dr. N. Sharifi, University of Kansas, post-doctoral appointment, 2015-2017.

Dr. S. Wang, University of Connecticut, post-doctoral appointment, 2010-2011.

Prof. M.T. Hyun, Faculty of Cheju National University, Korea, 2002-2003.

Dr. Lei Yang, University of Connecticut, post-doctoral appointment, 2000-2001.

Prof. J. Lee, Faculty of Yonsei University, Korea, 1998.

Dr. I. Ahmed, University of Connecticut, post-doctoral appointment, 1997-2000.

Prof. M.H. Song, Faculty of Dong-Guk University, Korea, 1996-1997.

Prof. J.H. Moh, Faculty of Wonkwang University, Korea, 1994-1995.

Prof. M.T. Hyun, Faculty of Cheju National University, Korea, 1993-1994.

Prof. J.A. Kasz, Faculty of Politechnika Krakowska, Poland, 1990-1993.

Ph.D. Dissertations:

C.D. Severt, Ph.D. (in progress).

J.R. Stark, "Analytical, Numerical, and Experimental Characterization of Air Cooled Cylindrical Heat Pipes under Forced Convection for Various Extended Surfaces," Ph.D., 2017.

N. Sharifi, "Comprehensive Numerical Modeling of Heat Pipe-Assisted Latent Heat Thermal Energy Storage Systems," Ph.D., 2014, (co-advised with A. Faghri).

H. Shabgard, "Heat Transfer and Thermodynamic Analysis of Heat Pipe-Assisted Latent Heat Thermal Energy Storage Systems for Concentrating Solar Power Applications," Ph.D., 2014, (co-advised with A. Faghri).

N. Fekrazad, "Behavior of PEM Fuel Cells with Variations in Compressive Loads of Fuel Cell Stacks," Ph.D., 2007.

M. Kandis, "Melting and Solidification of Polymer Powder using Infrared Laser Heating," Ph.D., 1999.

D.A. Hall, "Natural Convection Cooling of Vertical Rectangular Channels in Air Considering Radiation and Wall Conduction," Ph.D., 1997.

T.E. Voth, "Thermomechanical Compressive Pre-Melting of Solder Spheres," Ph.D., 1995.

Y.S. Son, "Multimode Heat Transfer during Reflow Soldering of Electronics Assemblies," Ph.D., 1994.

J.R. Keller, "An Investigation of Combined Surface Tension-Buoyancy Driven Flow," Ph.D., 1989.

MSME Theses:

C.W. Robak, "Latent Heat Thermal Energy Storage with Embedded Heat Pipes for Concentrating Solar Power Applications," M.S. Thesis, 2012 (co-advisor: A. Faghri).

S. Roychoudhary, "Simulation of the Thermal Spraying of Binary, Agglomerated Ceramic Particles by Plasma Spraying," M.S. Thesis, 2001.

R.M. Tarafdar, "Numerical and Experimental Study of One-Dimensional, Non-Isothermal Sintering of Amorphous Polymer Material," M.S. Thesis, 2001.

M. White, "An Experimental Study of a Phase Change Material Jacketed Vortex Tube for Use as a Passive Cooling Device," M.S. Thesis, 1995 (co-advisor: K.S. Ball).

A. Shah, "The Onset and Melting of Porous Metallic Layers," M.S. Thesis, 1994.

A. Liu, "Conjugate Heat Transfer in Solid-Liquid Systems Including Surface Tension Effects," M.S. Thesis, 1992.

T.E. Voth, "Experiments in Solid-Liquid Phase Change with Surface Tension in the Liquid Phase," M.S. Thesis, 1992.

M. Eftychiou, "Thermal Modeling of the Infrared Solder Reflow Process," M.S. Thesis, 1992.

T. Paul, "A Non-Intrusive Species Concentration Measurement Technique for Use in Liquid Phase Double Diffusive Convection," M.S. Thesis, 1990.

R. Bhandari, "A Numerical Study of the Thermal Processes Relevant to Infrared Solder Reflow," M.S. Thesis, 1990.

N. Fernandes, "An Experimental Study of the Thermal Processes Relevant to Infrared Solder Reflow," M.S. Thesis, 1990.

T. Labiosa, "Heat and Mass Transfer from a Partially-Saturated Granular Surface," M.S. Thesis, 1989.

J. Petri, "Augmentation of Natural Convection Cooling using Binary Gas Mixtures," M.S. Thesis, 1989.

E. Olsson, "Continuum Modeling of a Multidimensional Solid-Liquid Phase Change with Natural Convection," M.S. Thesis, 1989.

J. Grolmes, "Investigation of Microwave Drying of Transparent, Non-Hygroscopic Porous Materials," M.S. Thesis, 1988.

R. Srinivasan, "Numerical and Experimental Investigation of the Influence of the Soret Effect on Natural Convection in a Binary Liquid," M.S. Thesis, 1988.

Over 40 Undergraduate Research Assistants since 1985.

VIII. Professional Service

Editorial Positions:

Member, Editorial Board, *Frontiers in Heat and Mass Transfer*, 2010-present.

Associate Technical Editor, *ASME Journal of Heat Transfer*, 1995-1998.

Editorial Advisory Board, *ASME Heat Transfer Recent Contents*, 1998-2001.

Professional Committee Memberships and Leadership Activities:

International Scientific Committee, *19th Annual SolarPACES Conference*, Las Vegas, 2013.

Technical Program Chair, *2001 ASME-AIChE-AIAA-ANS National Heat Transfer Conference*, Anaheim, 1998-2001 (complete responsibility to organize a multi-society conference with over 500 attendees).

ASME Heat Transfer Division, K-21 *Committee on Education* (member since 2002).

ASME Heat Transfer Division, K-15 *Committee on Heat Transfer in Materials Processing and Manufacturing* (member since 1986).

ASME Heat Transfer Division, General Papers Review Committee, 1994 - 1997.

U.S. Scientific Committee, *11th International Heat Transfer Conference*, Seoul, 1995 - 1998.

U.S. Scientific Committee and Secretary, *10th International Heat Transfer Conference*, Brighton, 1991-1994.

Edited and Co-Edited Volumes:

J.J. Beaman, C. Atwood, T.L. Bergman, D. Bourell, S. Hollister and D. Rosen, *Additive/Subtractive Manufacturing Research and Development in Europe*, World Technology Evaluation Center (WTEC), Baltimore, 2004.

T.L. Bergman and C.B. Panchal, *Proceedings of the 2001 National Heat Transfer Conference*, ASME, New York, 2001 (CD Rom).

T.L. Bergman and M.A. Jog, *Transport Phenomena in Spray and Coating Processing*, in HTD-Vol. 366-3, 2000.

T.L. Bergman, T.H. Hwang et al., *Manufacturing and Materials Processing*, ASME HTD-Vol. 347, 1997.

V. Prasad, T.L. Bergman et al., *Thermal Transport in Solidification Processing*, ASME HTD-Vol. 323, 1996.

S. Paolucci, M.V. Karwe and T.L. Bergman, *Heat Transfer in Food Processing*, ASME HTD-Vol. 254, 1993.

M. Charmchi, S.M. Walsh, K.M. Moallemi, M. Chen, F. Incropera, T. Bergman, Y. Joshi and R.L. Mahajan, *Transport Phenomena in Materials Processing and Manufacturing*, ASME HTD-Vol. 196, 1992.

T.L. Bergman, D.A. Zumbrennen, Y. Bayazitoglu and A.G. Lavine, *Heat Transfer in Metals Processing and Containerless Manufacturing - 1991*, ASME HTD-Vol. 162, 1991.

P.J. Bishop, N. Lior, A. Lavine, M. Flik, M.V. Karwe, T.L. Bergman, C. Beckermann and M. Charmchi, *Transport Phenomena in Materials Processing - 1990*, ASME HTD-Vol. 146, 1990.

Approximately 15 technical sessions chaired or co-chaired at ASME Conferences, 1985-present.

International Lectures, Technology Evaluation, and Official Diplomatic Visits (Career):

Albert-Ludwigs-University, Freiburg (TE)
Cheju National University, Korea (D)
Fraunhofer Institute for Manufacturing and Advanced Materials, Bremen (TE)
Korea Advanced Institute for Science and Technology (D, L)
Kunsan National University, Korea (D)
Krakow Politechnica University, Poland (D)
LG Semicon, Taechi-dong, Korea (D, L, TE)
Loughborough University (D, TE)
Manchester Materials Science Center (TE)
Mercedes Benz, Stuttgart (D)
National Cheng Kung University, Taiwan (D, L)
National Sun Yat-sen University, Taiwan (D)
Pohang National University, Korea (D)
Seoul National University (D, L)
Technical University Berlin (D)
Tianjin University, China (D)
Trumpf, Stuttgart (D)
University of Bremen (TE)
University of Karlsruhe (D)
University of Leeds (TE)
University of Liverpool (TE)
University of Manchester Institute of Science and Technology (TE)

Major Advisory and Reviewing Activities (past six years):

- National Science Foundation, CAREER Advisory Committee, two days, December, 2012 (*one of approximately 20 invited participants from academia, DARPA, DOE, NIMH and ONR representing engineering, the hard sciences, and the social sciences tasked to advise NSF on the CAREER program of the future*).
- Department of Energy, Merit Review Panel, DOE National Laboratory Three-Year Operating Plans, July, 2012 and March, 2018 (*advise the U.S. DoE on solar energy*)

research performed at Argonne National Laboratory, Los Alamos National Laboratory, National Energy Technology Laboratory, National Renewable Energy Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Sandia National Laboratories, and elsewhere).

Reviewing for Funding Agencies and Participation in Strategic Studies (Career):

*World Technology Evaluation Center (WTEC)
Department of Defense
Department of Energy
National Science Foundation
National Research Council
New York State Office of Science, Technology and Academic Research
Israeli Ministry of Science
Israel Science Foundation
Swiss National Science Foundation
The Research Foundation Flanders (FWO)*

Reviewing for Journals (Career):

*ASME Journal of Heat Transfer
The International Journal of Heat and Mass Transfer (with Certificate of Outstanding Contribution in Reviewing, February, 2017)
Numerical Heat Transfer
AIAA Journal of Thermophysics and Heat Transfer
Experimental Thermal and Fluid Science
ASME Journal of Solar Energy Engineering
Solar Energy
Chemical Engineering Communications
Metallurgical Transactions
The Physical Review
Experimental Heat Transfer
ASME Journal of Fluids Engineering
ASME Journal of Electronics Packaging
Polymer Engineering & Science
Annals of the Entomological Society of America
ASME Journal of Applied Mechanics
Materials Science and Engineering A
International Journal of Thermal Sciences (with Certificate of Outstanding Contribution in Reviewing, February, 2018)
Mathematical and Computer Modelling
Acta Mechanica
Chemical Engineering Journal
International Journal of Nanoscience
Frontiers in Heat and Mass Transfer
Proceedings of the Royal Society A
Applied Thermal Engineering (with Certificate of Outstanding Contribution in Reviewing, May, 2017)
Applied Energy*

Energy Conversion and Management
Journal of Thermal Science and Engineering Applications
Journal of Renewable and Sustainable Energy
International Journal of Green Energy

Service as External Evaluator for Mechanical Engineering Departments (Career):

Mechanical and Industrial Engineering, University of Massachusetts - Amherst (2005)
Mechanical Engineering, The University of Texas at Austin (2006)

Recent Promotion and Tenure Evaluations (last 10 years):

Brigham Young University, IIT-Kanpur; Jordan University of Science and Technology; King Fahd University of Petroleum & Minerals; North Carolina State University; Princeton University; Purdue University; Rensselaer Polytechnic University; Rutgers University; SUNY Stony Brook; Tufts University; University of California, Los Angeles; University of Iowa; University of Missouri; University of South Carolina; University of Virginia; Virginia Polytechnic Institute and State University

IX. Teaching

Classes Taught at *Purdue University*:

ME 310 Fluid Mechanics
ME 315 Heat and Mass Transfer

Classes Taught at *The University of Texas at Austin*:

ME 242L Fluid and Thermal Systems Laboratory
ME 326H Introduction to Thermodynamics (Honors)
ME 328 Thermodynamics II
ME 339 Introduction to Heat Transfer
ME 340K Mechanical Engineering Measurements & Instrumentation
ME 345 Introduction to Fluid Mechanics
ME 360N Intermediate Heat Transfer
ME 381R Radiation Heat Transfer (graduate)
ME 381R Heat and Mass Transfer (graduate)
ME 381R Mass Transfer (graduate)

Classes Taught at the *University of Connecticut*:

ENGR 166 Foundations of Engineering
ME 242 Heat Transfer
ME 250 Fluid Mechanics I
ME 251 Fluid Mechanics II (Compressible Flow)
ME 320 Introductory Heat and Mass Transfer (graduate)
ME 323 Convection Heat Transfer (graduate)
ME 5110 Advanced Thermodynamics (graduate)
ME 5130 Advanced Heat and Mass Transfer (graduate)

Classes Taught at the *University of Kansas*:

ME 412 Design of Thermal Systems
ME 510 Fluid Mechanics
ME 590 Radiative Heat Transfer

ME 612 Heat Transfer
ME 790 Advanced Heat and Mass Transfer (graduate)

X. Contracts and Grants

“Heat Transfer Project,” *Boeing World Headquarters*, \$271,401, 2018-2019.

“Collaborative Research: EAGER: Exploring the Feasibility of a Novel Thermosyphon/Heat Pipe Heat Exchanger with Low Air-Side Thermal Resistance,” *National Science Foundation*, \$150,000, 2014-2016.

“Novel Thermal Energy Storage Systems for Concentrating Solar Power,” *Department of Energy*, \$1,764,000 (\$1,294,000 DoE funds plus additional \$470,000 match from industry), 2009-2013, with A. Faghri and R. Pitchumani.

“SGER: Engineered Microclimates for Enhanced Biomass Production,” *National Science Foundation*, \$80,000, 2007-2008.

“NSF Workshop: Transport Phenomena,” *National Science Foundation*, \$150,000, 2006-2007, with A. Faghri.

“Smart Salt Selection,” *GlaxoSmithKline*, \$68,052, 2005-2006, with R. Bogner.

“Acoustic Energy Anti-Ice Concept,” *Pratt & Whitney Aircraft*, 2005, \$50,000, with M.W. Renfro.

“Improved Power Density of Portable DMFC Fuel Cells and DMFC Miniaturization,” *U.S. Army*, \$75,000, 2003-2006.

“Technology Development for Endowed Chair Professors in the Connecticut Global Fuel Cell Center,” *Clean Energy Fund/Connecticut Innovations*, 2003, \$2,000,000.

“Development of a Large Scale Fuel Cell Testing Facility,” *Clean Energy Fund/Connecticut Innovations*, 2003-2004, \$1,000,000, with N.M. Sammes.

“Novel Thermal Control and Improved Power and Energy Density of Portable PEM Fuel Cells,” *U.S. Army*, \$72,515, 2002-2003.

“Investigation of Improved Methods for Accelerated Arc Cutoff,” *General Electric Industrial Systems Division*, \$127,592, 2000-2001, with B. Cetegen.

“Advanced Coating Technology Development for Enhanced Durability and Reduced Cost in Naval Applications,” *Office of Naval Research*, \$2,992,505, 1997-2002, with M. Gell, P. Strutt, N. Pature, P. Klemens, K. Gonsalves, D. Pease, L. Shaw, E. Jordan and B. Cetegen.

“Laser Beam Processing of Polymer Powder,” *University of Connecticut Research Foundation*, \$4,081, 1997-1998.

“Void Formation and Part Growth During Non-Isothermal Powder Sintering,” *National Science Foundation*, \$240,029, 1997-2002.

“Thermomechanical Modeling of the ‘Can-in-Canister’ Plutonium Immobilization Process,” *Department of Energy*, \$499,350, 1995-1997, with K.S. Ball.

“Precision and Repeatability in Polymeric SLS,” *Texas Advanced Technology Program, Manufacturing Technology Division*, \$140,254, 1994-1995, with K.L. Wood.

“NSF Workshop: Radiation Heat Transfer in Highly Coupled Physical Systems,” *National Science Foundation*, \$22,975, 1993, with J.R. Howell.

“Cooling of Airlocks and Hyperbaric Treatment Facilities during Rapid Pressurization,” *NASA Johnson Space Center*, \$60,738, 1993-1994, with K.S. Ball.

“Melting and Solidification of Porous Media,” *Texas Advanced Technology Program, Materials Science Division*, \$102,000, 1992-1993.

“Infrared Solder Reflow,” *IBM Corporation*, \$50,000, 1991-1992, with G.Y. Masada.

“Infrared Solder Reflow,” *IBM Corporation*, \$52,500, 1990-1991, with G.Y. Masada.

“Award for Creativity in Engineering: Melting and Solidification in Porous Media” *National Science Foundation*, \$90,000, 1990-1992.

“Texas Drying Research Consortium,” *Texas Higher Education Coordinating Board*, \$709,000, 1989-1992, with P.S. Schmidt, M.M. Crawford, J.R. Howell, J.A. Pearce and five researchers from Texas A&M University.

“Infrared Solder Reflow,” *IBM Corporation*, \$50,000, 1988-1989, with G.Y. Masada.

“Double-Diffusive Convection in Molten Alloys Relevant to Casting Processes,” *The Alcoa Foundation*, \$15,000, 1988-1989.

“Dielectric Drying of Industrial Materials,” *Electric Power Research Institute*, \$375,000, 1988-1989, with P.S. Schmidt, M.M. Crawford, J.A. Pearce and V.M. Torres.

“Dual Channel Imaging Radiometer for Research in Heating and Drying of Porous Media, Buoyancy/Surface Tension-Driven Flows, and Electronics Cooling,” *National Science Foundation*, \$49,000, 1988, with P.S. Schmidt, J.R. Howell and G.C. Vliet.

“Dielectric Drying of Industrial Materials,” *Electric Power Research Institute*, \$505,938, 1987-1988, with P.S. Schmidt, M.M. Crawford, J.A. Pearce and V.M. Torres.

“Numerical Simulation of Double-Diffusive Convection in the Mushy Zone,” *Alcoa Corporation*, \$12,530, 1987-1988.

“Dielectric Heating of Industrial Materials,” *Electric Power Research Institute*, \$492,300, 1986-1987, with P.S. Schmidt, M.M. Crawford and J.A. Pearce.

“Presidential Young Investigator Award,” *National Science Foundation*, \$191,797, 1986-1991.

“Investigation of Soret-Induced, Double-Diffusive Natural Convection in Binary Fluids,” *University of Texas, University Research Institute*, \$7,556, 1986.

“Development of Data Acquisition and Control for Natural Convection Experiments,” *IBM Project Quest*, \$10,000, 1986.

“Experimental Analysis of Thermocapillary Effects in Buoyancy Driven Flows,” *University of Texas, University Research Institute*, \$5,000, 1985.