

## Guo-Xiang Wang, Ph.D.

Associate Professor

Department of Mechanical Engineering

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### EDUCATION

Ph. D. (Mar. 1995), Mechanical Engineering, University of California at Santa Barbara (UCSB)

MS (Mar. 1986), Mechanical Engineering, Xi'an Jiaotong University, China

BS (July 1983), Mechanical Engineering, Xi'an Jiaotong University, China

### EXPERIENCE

**Associate Professor** (Aug. 2004 – ), Dept. Mechanical Engineering, The University of Akron

**Chang-Jiang Visiting Professor** (May 2006- ), Xi'an Jiaotong University, China

**Visiting Research Scientist** (May – July, 2002 and July – Aug., 2003) Beckman Laser Institute, University of California at Irvine.

**Assistant Professor** (Aug. 1998 – July, 2004), Dept. Mechanical Engineering, The University of Akron

**Research Scientist** (Jan. 1996 – Aug. 1998) AFOSR/DARPA Consortium for Crystal Growth Research & NSF Center for Thermal Spray Research, State University of New York at Stony Brook

**Post-Doctoral Fellow** (Feb. - Dec. 1995), Materials Research Laboratory, UCSB

**Research Assistant** (1990 - 1995), Materials Processing Laboratory, UCSB

### PROFESSIONAL ACTIVITIES

Member of ASME, TMS, and ASEE

Member of ASME K-15 committee; Member of TMS “Solidification committee”

#### **Session Chairs or Conference Organizer Committee Member**

*Manufacturing and Processing of Nano-Structured Materials and Systems*, 2001 IMECE, ASME, New York, Nov. 14-18, 2001

*Thermal Issues in Nanomaterials and Nanofabrication*, 2002 IMECE, ASME, New Orleans, Nov., 2002.

*Transport Phenomena in Crystal Growth*, 2003 ASME Summer Heat Transfer Conference, Las Vegas, Nevada, July 21-23, 2003.

*Transport Phenomena in Joining Process*, IMECE 2003, ASME, Washington D.C., Nov., 2003.

*Transport Phenomena in Manufacturing*, IMECE 2005, 2006, 2007 (ASME).

#### **Reviewer for Journals, Conferences, and Panels**

*Reviewer (Panelist) of Proposal Review for US National Science Foundation; Chinese NSF;*

*Australian Research Council Discovery Projects; Kentucky Science and Engineering Foundation*

*ASME Journal of Mechanical Design; International Journal of Transport Phenomena*

*Metallurgical Materials Transactions; International Journal of Heat and Mass Transfer*

*ASME Journal of Heat Transfer; Numerical Heat Transfer; Material Science Engineering*

*Applied Physics Letter, Journal of Applied Physics; IMECE; ISHMT/ASME Conference;*

### COURSES TAUGHT

**Undergraduate:** Thermodynamics I; Heat Transfer; ME Laboratory; Design of Energy System, Fluid Mechanics I & II, Engineering Analysis I & II, Concept of Design

**Graduate:** Advanced Thermodynamics; Thermal Radiation  
Fundamentals and Modeling of Crystallization and Solidification;  
Microscale Heat and Mass Transfer  
Two-Phase Flow and Boiling Heat Transfer

## PUBLICATIONS

(3 book chapters, 66 International Journal articles, 14 Chinese articles, 88 conference proceedings, 6 PhD student dissertations, 12 Master student theses, 900 total citation, h-index: 17)

### *Book Chapters*

1. G.-X. Wang and V. Prasad, 2000, "Rapid Solidification: Fundamentals and Modeling," *Annual Review in Heat Transfer*, C.L. Tien (Ed.), Vol. 11, pp. 207-305.
2. T. Kyu, H. Xu, T. Guo, and G.X. Wang, 2010, "Phase Field Modeling on Polymer Crystallization and Phase Separation in Crystalline Polymer Blends," in *Encyclopedia of Polymer Blends*, A. I. Isayev Eds., Wiley-VCH Verlag, Weinheim, Chapter 4, pp. 113-151.
3. D. Li, G.-X. Wang, and Y.L. He, 2011, "Thermal Modelling for Laser Treatment of Port Wine Stains," in *Developments in Heat Transfer*, Marco A. dos S. Bernardes (ed.), InTech, Chapter 27, pp. 537-556 (ISBN: 978-953-307-569-3). (<http://www.intechopen.com/books/developments-in-heat-transfer/thermal-modelling-for-laser-treatment-of-port-wine-stains>).

### *Journal Articles*

1. Li D., Chen B., Wu W.J., Wang G.X., and He Y.L., 2014, Multi-scale modeling of tissue freezing during cryogen spray cooling with R134a, R407c and R404a. *Applied Thermal Engineering*, (accepted).
2. Li D., Farshidi D., Wang G.X., He Y.L., Kelly K.M., Wu W.J. and Ying Z.X. 2014, A comparison of microvascular responses to visible and near-infrared lasers. *Lasers in Surgery and Medicine* (accepted).
3. Li D., Wang G.X., He Y.L., Wu W.J., and Chen B 2014, A three-temperature model of selective photothermolysis for laser treatment of port wine stain containing large malformed blood vessels. *Applied Thermal Engineering*, Vol. 65, No. 1-2, pp.308-321.
4. Li D., Chen B., Wu W.J., He Y.L. Xing L.Z., and Wang G.X, 2014, Numerical Analysis of Cold Injury of Skin in Cryogen Spray Cooling for Laser Dermatologic Surgery, *American Journal of Heat and Mass Transfer*, Vol. 1, No. 1, pp.38-51.
5. Li D, Wang G.-X., He Y.L., etc., 2013, A Two-Temperature Model for Selective Photothermolysis Laser Treatment of Port Wine Stains, *Applied Thermal Engineering*, Vol.59, pp. 41-51.
6. Zhou Z-F, Wang G-X, Chen B, et al., 2013, Evaluation of Evaporation Models for Single Moving Droplet with a High Evaporation Rate, *Powder Technology*, Vol. 240, pp. 95-102.
7. Li D, He Y-L, Wang G-X, et al., 2013, A new model of selective photothermolysis to aid laser treatment of port wine stains, *Chinese Science Bulletin*, Vol. 58, pp. 416-426.
8. Sun F, Martinez-Suastegui L, Wang G-X, et al., 2012, Numerical prediction of the intracellular ice formation zone during cryosurgery on a nodular basal cell carcinoma using liquid nitrogen spray, *Int. J. Spray Combustion Dynamics*, Vol.4, No.4, pp. 341-379.

9. Zhou, Z.-F., Wu W.T., Chen B., Wang, G.-X., and Guo L.-J., 2012, "An experimental study on the spray and thermal characteristics of R134a two-phase flashing spray," *Int. J. Heat Mass Transfer*, Vol. 55, no. 15-16, pp. 4460-4468.
10. Zhou, Z.-F., Chen B., Guo L.-J., Wang Y.-S. and G.-X. Wang, 2012, "An Experimental Study on Pulsed Spray Cooling with Refrigerant R-404a in Laser Surgery," *Applied Thermal Engineering*, Vol. 39, pp. 29-36.
11. Ying, Z.-X., Ma, H.-Q., Liu, Y., Xiao, S.-X., Wang, Y.-X., Wang, G.-X., 2011, "A novel mutation of CYLD in a Chinese family with multiple familial trichoepithelioma," *J. European Academy Dermatology Venereology* (in Press).
12. Qin, Z., Zhe, J., Wang, G.-X., 2011, Effects of particle's off-axis position, shape, orientation and entry position on resistance changes of micro Coulter counting devices, *Measurement Science and Technology*, 22 (4), art. no. 045804.
13. Y. Li, J.J. Yan, J. Wang, G-X Wang, 2011, "A Semi-Empirical Model for Condensation Heat Transfer Coefficient of Mixed Ethanol-Water Vapors", *J. Heat Transfer*, June 2011, Vol. 133 / 061501:1-11.
14. Ma XQ, Wang YS, Yu FJ, Wang G.-X., 2010, Numerical simulations of the discontinuous progression of cerebral aneurysms based on fluid-structure interactions study, *Science China - Physics Mechanics & Astronomy*, 53 (5), pp: 944-953.
15. Y.S. Wang, Y.L. Wang, G.-X. Wang, et al., 2009, Prediction of evaporation heat transfer coefficient based on gas-liquid two-phase annular flow regime in horizontal microfin tubes, *Applied Thermal Engineering*, Vol. 29, pp. 2970-2976.
16. D.C. Lin, R. Kovacevic, T.S. Srivatsan, and G-X. Wang, 2008, A Study aimed at characterizing the interfacial structure in a tin-silver solder on nickel-coated copper plate during aging, *Sadhana*, Vol. 33, Part 3, pp. 251-259.
17. X.L. Huai, Wang, G.-X.; et al., 2008, Microscopic explosive boiling induced by a pulsed-laser irradiation, *Heat Mass Transfer*, Vol. 45, No. 1, pp. 117 - 126.
18. D.C. Lin, T.S. Srivatsan, G-X. Wang, and R. Kovacevic, 2007, The influence of nano-particles on microstructural, development at the interface of Sn3.5Ag-solder and Cu-substrate, *Int. J. Nanomanufacturing*, Vol. 1, No. 3, pp. 357-369.
19. D.C. Lin, T. S. Srivatsan, G.X Wang, R. Kovacevic, 2007, "Understanding the Influence of Copper Nanoparticles on Thermal Characteristics and Microstructural Development of a Tin-Silver Solder," *J. Materials Engineering Performance*, Vol. 16, pp.647-654.
20. D.C. Lin, T.S. Srivatsan, G.-X. Wang and R. Kovacevic, 2006, "Microstructural Development in Rapidly Cooled Eutectic Sn-3.5%Ag Solder Reinforced with Copper Powder," *Powder Technology*, Vol. 166, No.1, pp. 38-46.
21. H. Li, G.-X. Wang and E.A. Evans, 2006, "Determination of Surface Heating Distribution to Establish Targeted Thermal Environments in Industry Hydrothermal Autoclaves," *Numerical Heat Transfer, Part A*, Vol.50, No. 5, pp. 419-436.

22. H. Li, E.A. Evans, and G.-X. Wang, 2005, "A three dimensional conjugate model with realistic boundary conditions for Flow and heat transfer in an industry scale hydrothermal autoclave," *Int. J. Heat Mass Transfer*, Vol. 48, pp. 5166-5178.
23. X.L. Huai, Z.W. Tang, G.-X. Wang and W.W. Wang, 2005, "Multi-phase flow and heat transfer of a micro-pump thermally driven by a multi-output pulse laser," *Chinese Physics Letter*, Vol. 22, No. 2, pp. 398-401.
24. W. Franco, J. Liu, G.-X. Wang, J. S. Nelson and G. Aguilar, 2005, "Radial Heat Transfer Dynamics during Cryogen Spray Cooling," *Physics Medicine Biology*, Vol. 50, pp. 387-397.
25. H. Li, E. A. Evans, and G. - X. Wang, 2005, "Single- and multi-hole baffles – a heat transfer and fluid flow control for hydrothermal growth," *J. Crystal Growth*, Vol. 275, pp. 561-571.
26. D.C Lin, C.Y. Kuo, T.S. Srivatsan, M. Petraroli, and G.-X. Wang, 2005, "Synthesis and Characterization of Nano-Composite Lead-Free Solder," *J. Metastable & Nanocrystalline Materials*, Vol. 23, pp. 145-148.
27. H. Li, M.J. Braun, E.A. Evans, G.-X. Wang, G. Paudel, and J. Miller, 2005, "Natural Convection Flow Structure and Heat Transfer in a Model Hydrothermal Growth Reactor," *Int. J. Heat Fluid Flow*, Vol. 26, No. 1, pp. 45-55.
28. W.C. Jia, G. Aguilar, G.-X. Wang, and J. S. Nelson, 2004, "Heat transfer dynamics during cryogen spray cooling of substrate at different initial temperatures," *Physics Medicine Biology*, Vol. 49, 5295-5308.
29. H. Li, G.-X Wang, and E. Evans, 2004, "Three-Dimensional Flow of Solution in an Industry-Size Hydrothermal Autoclave Subjected to Non-Uniform Heating – Effects of a Baffle on Flow and Temperature Separation," *J. Crystal Growth*, Vol. 271, pp. 257-267.
30. X.L. Huai, G.-X. Wang, R.Q. Jiang, and B. Li, 2004, "Non-classical diffusion model for heat and mass transfer in laser drying," *J. University of Science and Technology Beijing*, Vol. 11, No. 5, pp. 455-461; also in *Proceedings of 35th National Heat Transfer Conference*, June, 2001, Anaheim, California, NHTC01-11918.
31. G.-X. Wang, R. Goswami, S. Sampath, and V. Prasad, 2004, "Understanding the Heat Transfer and Solidification Plasma-Sprayed Yttria-Stabilized Zirconia Coatings," *Materials and Manufacturing Processes*, Vol. 19, No. 2, pp. 261-271; also in *Proceedings of The 4<sup>th</sup> ISHMT-ASME Heat Transfer Conference*, Jan., 2000, India, pp. 1135-1140
32. X.L. Huai, D.Y. Liu, Z.Y. Dong, R.X. Jin, G.-X. Wang, 2003, "Rapid transient explosive boiling of binary mixture under pulsed-laser irradiation," *Science In China Series E-Technological Sciences*, Vol. 46, No. 5, pp. 490-497.
33. G. Aguilar, G.-X. Wang and J. S. Nelson, 2003, "Effect of Spurt Duration on the Heat Transfer Dynamics during Cryogen Spray Cooling," *Physics Medicine Biology*, Vol. 48, No. 14, pp. 2169 – 2181.
34. X.L. Huai, X.F. Peng, G.-X. Wang, and D. Y. Liu, 2003, "Multi-Phase Flow and Drying Characteristics in a Semi-circular Impinging Stream Dryer," *Int. J. Heat Mass Transfer*, Vol. 46, pp. 3061-3067.
35. D. Lin, S. Liu, T. Guo, G.-X. Wang, T.S. Srivatsan, and M. Petraroli, 2003, "An Investigation of Nanoparticles addition on Solidification Kinetics and Microstructure Development of Tin-Lead Solder," *Mater. Sci. Eng. A*, Vol. A360, pp. 285-292.

36. G. Aguilar, G.-X. Wang, and J.S. Nelson, 2003, "Dynamic Cooling Behavior during Cryogen Spray Cooling: Effects of Spurt Duration and Spray Distance," *Lasers in Surgery and Medicine*, Vol. 32, pp. 152-159, 2003.
37. G.-X. Wang, C. Yao, and B. T. F. Chung, 2003, "Thermal Analysis on Planar Interface Stability in Solidification of Semitransparent Materials," *AIAA J. Thermophysics Heat Transfer*, Vol. 17, No.2, pp. 193-198.
38. H.M. Li, A. Evans, and G.-X. Wang, 2003, "Flow of Solution in Hydrothermal Autoclaves with various Aspect Ratios," *J. Crystal Growth*, Vol. 256, pp. 146-155.
39. D. Lin, G.-X. Wang, T.S. Srivatsan, and M. Petraroli, 2003, "Influence of Titanium Dioxide Nanopowder Addition on Microstructural Development and Hardness of Tin-Lead Solder," *Materials Letters*, Vol. 57, pp. 3193-3198.
40. D. C. Lin, G.-X. WANG, and T. S. Srivatsan, 2003, "A Mechanism for the Formation of Equiaxed Grains in Welds of Aluminum-Lithium Alloy 2090," *Mat. Sci. Eng. A*, Vol. 351, pp. 304-309.
41. G.-X. Wang and E.F. Matthys, 2002, "An Experimental Determination of Interfacial Heat Transfer during Melt Cooling and Solidification of Molten Metal Droplets on a Metallic Substrate: Effect of surface roughness and melt super heat," *Int. J. Heat Mass Transfer*, Vol. 45, pp.4967-4981.
42. D. Lin, G.-X. Wang, T.S. Srivatsan, et al., 2002, "The Influence of Copper Nanopowders on Microstructure and Hardness of Lead-Tin Solder," *Materials Letters*, Vol.53, pp. 333-338.
43. G.-X. Wang and E.F. Matthys, 2002, "Mathematical Simulation of Melt Flow, Heat Transfer and Nonequilibrium Solidification in Planar Flow casting," *Modelling Simulation Mater. Sci. Eng.*, Vol. 10, pp. 35-55.
44. G.-X. Wang and E.F. Matthys, 2002, "Spallation of a Substrate by Thermal Shock and Thermal Expansion Differential during Splat Cooling," *Materials Manufacturing Processes*, Vol. 17, pp. 67-84.
45. C. Yao, B. T. F. Chung, and G.-X. Wang, 2002, "Mushy Zone Equilibrium Solidification of a Semitransparent Layer Subject to Radiative and Convective Cooling," *Int. J. Heat and Mass Transfer*, Vol.45, pp. 2397-2405.
46. G.-X. Wang, V. Prasad, and S. Sampath, 2001, "Rapid Solidification in Thermal Spray Deposition: Microstructure and Modeling," *Sadhana (India Academy of Science)*, Vol. 26, Part 1&2, pp. 35-57.
47. G.-X. Wang and V. Prasad, 2000, "Microscale Heat and Mass Transfer and Non-Equilibrium Phase Change in Rapid Solidification," *Mater. Sci. Eng. A*, Vol. 292, No. 2, pp. 142-148.
48. C. Yao, G.-X. Wang, and B. T. F. Chung, 2000, "A Non-Equilibrium Planar Interface Model for Solidification of Semitransparent Radiating Materials," *AIAA J. Thermophysics Heat Transfer*, Vol. 14, No. 3, pp. 297-304.
49. G.-X. Wang, V. Prasad, and S. Sampath, 2000, "An Integrated Model for Dendrite and Planar Interface Growth and Morphology Transition in Rapid Solidification," *Metall. Mater. Trans.* Vol. 31A, pp. 735 - 746.
50. S.P. Wang, G.-X. Wang, and E.F. Matthys, 1999, "Deposition of a Molten Layer of High Melting Point Material: Substrate Melting and Resolidification," *Mater. Sci. Eng. A*, Vol. A262, pp. 25-32.
51. Y.P. Wan, V. Prasad, G.-X. Wang, S. Sampath, and J. Fincke, 1999, "Modeling of Powder Particle Heating and Evaporation in Plasma Spraying Process", *J. Heat Transfer*, Vol. 121, pp. 691-699.

52. T. Zhang, G.-X. Wang, F. Ladeinde, and V. Prasad, 1999, "Turbulent Transport of Oxygen in the Czochralski Growth of Large Silicon Crystals," *J. Crystal Growth*, Vol. 198/199, pp. 141-146.
53. Y.F. Zou, G.-X. Wang, H. Zhang, and V. Prasad, 1999, "Mechanisms of Thermal-Solutal Transport and Segregation in a High Pressure Liquid-Encapsulated Czochralski System," *J. Heat Transfer*, Vol. 121, pp. 148-159.
54. S.-P. Wang, G.-X. Wang, and E.F. Matthys, 1998, "Melting and Resolidification of a Substrate in Contact with a Molten Metal : Operational Maps," *Int. J. Heat Mass Transfer*, Vol. 41, No. 10, pp. 1177-1188.
55. Y.F. Zou, G.-X. Wang, H. Zhang, V. Prasad, and D.F. Bliss, 1997, "Macrosegregation, Dynamics of Interface, and Stress in High Pressure LEC Grown Crystals," *J. Crystal Growth*, Vol. 180, pp. 524-533.
56. G.-X. Wang, S. Sampath, V. Prasad, and H. Herman, 1997, "On the Stability of Rapid Planar Solidification during Melt-Substrate Quenching," *Mater. Sci. Eng. A*, Vol. A226-228, pp. 1035-1038.
57. G.-X. Wang, V. Prasad, and E.F. Matthys, 1997, "An Interface-Tracking Numerical Method for Rapid Planar Solidification of Binary Alloys with Application to Microsegregation," *Mater. Sci. Eng. A*, Vol. A225, pp.47-58.
58. G.-X. Wang and V. Prasad, 1997, "Non-Equilibrium Phenomena in Rapid Solidification: Theoretical Treatment for Process Modeling," *Microscale Thermophysical Engineering*, Vol.1, pp. 143-157.
59. G.-X. Wang, V. Prasad, and E.F. Matthys, 1997, "Solute Distribution during Rapid Solidification into an Undercooled Melt," *J. Crystal Growth*, Vol. 174, pp. 35-40.
60. G.-X. Wang and E.F. Matthys, 1996, "Modeling of Non-equilibrium Surface Melting and Resolidification for Pure Metals and Binary Alloys," *J. Heat Transfer*, Vol.118, pp. 944-951.
61. G.-X. Wang and E.F. Matthys, 1996, "Experimental Investigation of Interfacial Thermal Resistance for Molten Metal Solidification on a Substrate," *J. Heat Transfer*, Vol.118, pp. 157-163.
62. W. Liu, G.-X. Wang, and E.F. Matthys, 1995, "Thermal Analysis and Measurements for a Molten Metal Drop Impacting on a Substrate: Cooling, Solidification, and Heat Transfer Coefficient," *Int. J. Heat Mass Transfer*, Vol. 38, pp. 1387-1395.
63. G.-X. Wang and E.F. Matthys, 1992, "Numerical Modeling of Phase Change and Heat Transfer during Rapid Solidification Processes: Use of Control Volume Integral with Element Subdivision," *Int. J. Heat Mass Transfer*, Vol.35, pp. 141-153.
64. G.-X. Wang and E.F. Matthys, 1991, "Modeling of Heat Transfer and Solidification during Splat Cooling: Effect of Splat Thickness and Splat / Substrate Thermal Contact," *Int. J. Rapid Solidification*, Vol.6, pp. 141-174.
65. G.-X. Wang and E.F. Matthys, 1991, "Heat Transfer Modeling of Rapid Solidification on a Substrate: A Parametric Investigation for Large Undercooling," *Int. J. Rapid Solidification*, Vol.6, pp. 297-324.
66. G.-X. Wang and E.F. Matthys, 1991, "Modeling of Rapid Solidification by Melt-spinning: Effect of Heat Transfer in the Cooling Substrate," *Mater. Sci. Eng. A*, Vol. A136, pp. 85-97.

### Chinese Journal Articles (in Chinese):

1. (李东, 王国祥, 何雅玲, 吴文娟, 陈斌, 激光与生物组织选择性光热效应的两温度模型, *工程热物理学报*, 2014, 已接收.)
2. Wu WJ, Li D, Xing LZ, Chen B, and Wang G-X, 2014, Dynamic Characteristics of Vascular Morphology after 1064 nm Laser Exposure, *Chinese Journal of Lasers*, Vol. 41, No. 3, paper:0304001 (吴文娟, 李东, 邢林庄, 陈斌, 王国祥, 1064nm激光照射下血管形态的动态变化, *中国激光*, 2014, 41(3):0304001)
3. Wu WJ, Li D, Wang G-X, Wang Y-S, Chen B, 2013, Dynamic optical absorption characteristic of human blood in visible- and near-infrared light with variable temperature, *CIESC Journal*, Vol. 64, No. 4, pp. 1162-1162. (吴文娟, 李东, 王国祥, 王跃社, 陈斌, 血液在可见光及近红外范围内随温度变化的动态吸收特性, *化工学报*, 2013, 64(4): 1157-1162).
4. Zhou Z-F, WU W-T, Wang G-X, Chen B, Wang Y-S, 2013, An Experimental Study on the Droplets Dynamics of Flashing Spray With R134a, *Journal of Engineering Thermophysics*, Vol. 34, No.1, pp.87-90. (周致富, 吴威涛, 王国祥, 陈斌, 王跃社, R134a闪蒸喷雾液滴动力学特征实验研究, *工程热物理学报*, 2013, 34(1):87-90)
5. Xin J.-J., Zhou Z.F, Xin H., Chen B., Wang G.-X, and Guo L.J., 2012, Validation analysis of different mass transfer formula in single droplet evaporation model, *CIESC Journal*, Vol. 62, No. 11, pp. 3060-3065. (辛娟娟, 周致富, 辛慧, 陈斌, 王国祥, 郭烈锦, 单个液滴蒸发模型中不同质量传递公式的有效性分析, *化工学报*, 2012, 63(6): 1704-1708)
6. Zhou, Z.-F., Wang Y., Wang, G.-X., Guo L.-J., Chen, B., and Wang, Y.-S., 2012, "Effect of Nozzle diameter on surface heat transfer in cryogen spray cooling for laser dermatology" *Chinese Journal of Lasers*, Vol. 39, No. 3, pp. 80-86. (周致富, 王锐, 王国祥, 郭烈锦, 陈斌, 王跃社. 激光手术中喷嘴尺寸对制冷剂闪蒸喷雾冷却表面传热特征影响的实验研究, *中国激光*, 2012, 39(3): 80-86)
7. Zhou, Z.F., Wu, W.T., Wang, G.-X., Chen, B., Wang, Y.S. and Gong, Z., 2011, "Thin-film thermocouples for rapid measurement of transient surface temperature in cryogen spray cooling," *CIESC Journal*, Vol. 62, No. 11, pp. 3060-3065. (周致富, 吴威涛, 王国祥, 陈斌, 王跃社, 龚政, 制冷剂闪蒸瞬态喷雾冷却表面温度的快速测量, *化工学报*, 2011, 62(11): 2691-2695)
8. Zhou, Z.-F., Wu, W.-T., Gong, Z., Wang, G.-X., Chen, B., and Wang, Y.-S., 2011, "An experimental study on the atomization dynamics and heat transfer characteristics in flashing transient spray with refrigerant R134A," *Journal of Engineering Thermophysics*, 32 (6), pp. 977-980. (周致富, 吴威涛, 龚政, 王国祥, 陈斌, 王跃社, 2011, R134制冷剂闪蒸瞬态喷雾和传热特性的实验研究, *工程热物理学报*, 32(6):977-980)
9. Liu, J.-F., Chen, B., Wang, G.-X., Wang, Y.-S., 2010, Prediction of surface heat flux in a water jet cooling process, *Journal of Engineering Thermophysics*, Vol. 31, No. 1, pp. 110-112. (刘俊峰, 陈斌, 王国祥, 王跃社, 水射流冷却过程中表面热流密度的预测, *工程热物理学报*, 31(1): 110-112)
10. Xin H., Zhou Z., Wang G., Chen B., Wang Y. 2009, Evaporation characteristics of single R404a droplet in laser treatment of PWS in conjunction with cryogen spray cooling, *Chinese Journal of*

- Lasers*, Vol. 36, No. 10, pp. 2691-2695. (辛慧, 周致富, 陈斌, 王国祥, 王跃社, 激光手术中喷雾冷却中R404a液滴的蒸发特性, *中国激光*, 2009, 36(10): 2691-2695)
11. Xin, H., Zhou, Z.-F., Chen, B., Wang G.-X., Wang, Y.-S., 2009, Comparative analysis of single droplet evaporation models in Cryogen Spray Cooling, *Journal of Engineering Thermophysics*, Vol. 30, No. 4, pp. 653-656. (辛慧, 周致富, 陈斌, 王国祥, 2009, 激光治疗葡萄酒色斑的制冷剂喷雾冷却中单液滴蒸发理论模型比较, *工程热物理学报*, 9, 30(4):653-656)
  12. Wang, Y.-S., Qin, Z.-P., Wang, G.-X., 2008, Instability analysis of gas-liquid interface associate with annular flow in horizontal micro tubes, *Journal of Engineering Thermophysics*, Vol. 29, No. 4, pp. 625-627. (王跃社, 秦真鹏, 王国祥, 2008, 水平微圆管内环状流气液界面不稳定性分析, *工程热物理学报*, 29(4): 625-627.)
  13. Zhou, Z., Xin, H., Chen, B., Wang, G., 2008, Evaporation characteristics of a single droplet in laser treatment of port wine stain in conjunction with cryogen spray cooling, *Chinese Journal of Lasers*, Vol.35, No.6, pp. 952-956. (周致富, 辛慧, 陈斌, 王国祥, 2008, 激光手术喷雾冷却中单个液滴蒸发特性研究, *中国激光*, 35 (6): 952- 956)
  14. Li, D., He, Y.-L., Wang, G.-X., Liu, Y.-W., Xiao, J., 2007, Numerical simulation of cryogen spray cooling during the laser treatment of port wine stain, *Journal of Engineering Thermophysics*, 29 (12), pp. 2107-2110. (李东, 何雅玲, 王国祥, 刘迎文, 肖杰, 2007, 激光治疗PWS中制冷剂喷射冷却过程的数值模拟, *工程热物理学报*, 29 (12): 2107~2110.)



### Articles in Peer-Reviewed Conference Proceedings:

1. Li D., Chen B., Wu W.J., Wang G.X., He Y.L., Ying Z.X. Experimental study on the vascular thermal response to visible lasers. *15th International Heat Transfer Conference*, August 10-15, 2014, Kyoto, Japan.
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