

EVELYN N. WANG

ASSOCIATE PROFESSOR, GAIL E. KENDALL PROFESSOR

MECHANICAL ENGINEERING
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
enwang@mit.edu

Professor Evelyn N. Wang is an Associate Professor, the Gail E. Kendall Professor, in the Department of Mechanical Engineering at the Massachusetts Institute of Technology. Professor Wang earned her B.S. degree in Mechanical Engineering from the Massachusetts Institute of Technology; and her S.M. and Ph.D. degrees in Mechanical Engineering from Stanford University. She was a postdoctoral associate at Bell Laboratories, Alcatel Lucent from 2006-2007. She joined the MIT faculty in 2007. Professor Wang teaches and conducts research in the area of micro/nanoscale heat and mass transfer.

Professor Wang's research program combines fundamental studies of micro/nanoscale heat and mass transport processes with the development of novel engineered structures to create innovative solutions in thermal management, energy, and water desalination systems. Her group leverages state-of-the-art micro/nanofabrication, unique measurement, and model prediction capabilities to perform in-depth studies and enable mechanistic insights into complex fluidic and thermal transport processes for these applications. Meanwhile, this approach has also led to the discovery of novel flow and transport phenomena, which offers great potential to realize new and important functionalities.

Professor Wang has published over 90 archival journal papers in prestigious journals including Nature Materials, Nature Nanotechnology, Nature Communications, Nature Energy, Journal of Heat Transfer, International Journal of Heat and Mass Transfer, and numerous conference papers. She has advised 24 Master's students, 8 PhD students and several Postdoctoral Associates now pursuing successful careers in industry, national labs, and academia including faculty positions at University of Illinois Urbana Champaign, University of Michigan, Rensselaer Polytechnic Institute, Drexel University, Syracuse University, Indian Institute of Technology Patna, and Kyung Hee University.

Professor Wang's research has been honored with awards including the 2008 DARPA Young Faculty Award, the 2011 Air Force Office of Scientific Research Young Investigator Award, the 2012 Office of Naval Research Young Investigator Award, 2012 Bergles-Rohsenow Young Investigator Award in Heat Transfer, best paper awards at 2010 and 2014 ITherm, and 2012 ASME International Micro/Nanoscale Heat and Mass Transfer Conference, best poster awards at the 2014 and 2016 ITherm, and a fellow of the ASME. She is currently the Associate Director of the Solid State Solar Thermal Energy Conversion (S³TEC) Center, an Energy Frontier Research Center, funded by the US Department of Energy. She is also an Associate Director of the Microsystems Technology Lab at MIT. She is the co-founder of the first 2015 Gordon Research Conference on Micro and Nanoscale Phase Change Heat Transfer and has been extensively involved as a committee member and organizer of national and international conference

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ASSOCIATE PROFESSOR, GAIL E. KENDALL PROFESSOR
DEPARTMENT OF MECHANICAL ENGINEERING
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Education:

Ph.D.	Stanford University	2006
S.M.	Stanford University	2001
S.B.	Massachusetts Institute of Technology	2000

Appointments:

Postdoctoral Associate, Bell Labs, Alcatel-Lucent	2006-2007
MIT Assistant Professor of Mechanical Engineering	2007-2011
Associate Professor of Mechanical Engineering	2011-present
Associate Director of Solid State Solar Thermal Energy Conversion Center	2013-present
Associate Director of the Microsystems Technology Laboratory, MIT	2015-present

Select Honors and Awards:

DARPA Young Faculty Award	2008
Esther and Harold E. Edgerton Chair	2008
ITherm Best Paper Award	2010
AFOSR Young Investigator Award	2011
ASME Micro/Nanoscale Heat and Mass Transfer Intl Conference Best Paper Award	2012
ONR Young Investigator Award	2012
ASME Bergles-Rohsenow Young Investigator Award in Heat Transfer	2012
ITherm Best Paper Award	2014
ITherm Best Poster Award	2014
Gail E. Kendall Chair Professor	2015
Defense Science Study Group	2015
ASME Fellow	2015
ITherm Best Poster Award	2016

Select Professional Service:

NSF Review Panels	2007-present
Associate Editor, Nature Microsystems and Nanoengineering	2015-present
Associate Editor, Nanoscale and Microscale Thermophysical Engineering	2014-present
Chair, 2017 Gordon Research Conference on Micro and Nanostructures for Phase Change Heat Transfer	2015-present
Chair, 2016 ASME International Conference of Nano Micro and Minichannels	2016-present
Journal Reviewer including:	2004-present
Journal of Heat Transfer, International Journal of Heat and Mass Transfer, Langmuir, Proceedings of the National Academy of Sciences, Nature Communications, Applied Physics Letters, Science, Nature Nanotechnology.	

Publications of Evelyn N. Wang

Professor Wang, together with her research group and collaborators, has published over 00 peer-reviewed archival journal publications; over 70 conference proceedings papers, and is a co-inventor on several issued and pending U.S. Patents. Professor Wang has advised 24 S.M. theses, 8 PhD theses, as well as several postdoctoral associates. A list of Archival Refereed Journal Articles is provided below in chronological order:

1. Balandin, A., Wang, K.L., Cai, S., Li, R., Viswanathan, C.R., Wang, E.N., and M. Wojtowicz, "Investigation of Flicker Noise Level and Deep Levels in AlGaIn/GaN Heterostructure Field Effect Transistors," *Journal of Electronic Materials*, 29(3), 297-301, 2000.
2. Wang, E.N., Zhang, L., Jiang, L., Koo, J.-M., Maveety, J.G., Sanchez, E.A., Goodson, K.E., and T.W. Kenny, "Micromachined Jets for Liquid Impingement Cooling of VLSI Chips," *Journal of MicroElectroMechanical Systems*, 13(15), 833-842, 2004.
3. Wang, E.N., Devasenathipathy, S., Santiago, J.G., Goodson, K.E., and T.W. Kenny, "Nucleation and Growth of Vapor Bubbles in a Heated Silicon Microchannel," *Journal of Heat Transfer*, 126(4), 497, 2004.
4. Zhang, L., Wang, E.N., Goodson, K.E., and T.W. Kenny, "Phase Change Phenomena in Silicon Microchannels," *International Journal of Heat and Mass Transfer*, 48(8), 1572-1582, 2005.
5. Hidrovo, C.H., Kramer, T.A., Wang, E.N., Vigneron, S., Steinbrenner, J.E., Koo, J.-M., Wang, F.-M., Fogg, D.W., Flynn, R.D., Lee, E.S., Cheng, C.-H., Kenny, T.W., Eaton, J.K., and K.E. Goodson, "Two-Phase Microfluidics for Semiconductor Circuits and Fuel Cells," *Heat Transfer Engineering*, 27(4), 53-63, 2006.
6. Kenny, T.W., Goodson, K.E., Santiago, J.G., Wang, E., Koo, J.-M., Jiang, L., Zhang, L., Fogg, D., Yao, S., Rose, K., Flynn, R., Cheng, C.-H., and C. Hidrovo, "Advanced Cooling Technologies for Microprocessors," *International Journal of High Speed Electronics and Systems*, 16, 301-313, 2006.
7. Wang, E.N., Devasenathipathy, S., Lin, H., Hidrovo, C.H., Santiago, J.G., Goodson, K.E., and T.W. Kenny, "A Hybrid Method for Bubble Reconstruction in Two-Phase Microchannels," *Experiments in Fluids*, 40, 847-858, 2006.
8. Krupenkin, T.N., Taylor, J.A., Wang, E.N., Kolodner, P., Hodes, M., and T.R. Salamon, "Reversible Wetting-dewetting Transitions on Electrically Tunable Superhydrophobic Nanostructured Surfaces," *Langmuir*, 23, 9128-9133, 2007.

9. Wang, E.N., Bucaro, M., Taylor, J.A., Kolodner, P., Aizenberg, J., and T. Krupenkin, "Droplet Mixing Using Electrically Tunable Superhydrophobic Nanostructured Surfaces," *Microfluidics and Nanofluidics*, 7(1), 137-140, 2008.
10. Alexander, B.A., and E.N. Wang, "Design of a Microbreather for Two-Phase Microchannel Heat Sinks," *Nanoscale and Microscale Thermophysical Engineering*, 13(3), 151-164, 2009.
11. Xiao, R., Chu, K.-H., and E.N. Wang, "Multi-layer Liquid Spreading on Superhydrophilic Nanostructured Surfaces," *Applied Physics Letters*, 94(19), 193104, 2009.
12. Chu, K.-H., Xiao, R., and E.N. Wang, "Uni-directional Spreading on Asymmetric Nanostructured Surfaces," *Nature Materials*, 9, 413-417, 2010.
13. Xiao, R., Enright, R., and E.N. Wang, "Prediction and Optimization of Liquid Propagation in Micropillar Arrays," *Langmuir*, 26(19), 15070-15075, 2010.
14. Won, Y., Wang, E.N., Goodson, K.E., and T.W. Kenny, "3-D Visualization of Flow in Microscale Jet Impingement Systems," *International Journal of Thermal Sciences*, 50(3), 325-331, 2011.
15. Allison, J.M., Staats, W.L., McCarthy, M., Jenicek, D., Edoh, A.K., Lang, J.H. , Wang, E.N. , and J.G. Brisson, "Enhancement of Convective Heat Transfer in an Air-cooled Heat Exchanger using Interdigitated Impeller Blades," *International Journal of Heat and Mass Transfer*, 54(21), 4549-4559, 2011.
16. Miljkovic, N. and E.N. Wang, "Modeling and Optimization of Hybrid Solar Thermoelectric Systems with Thermosyphons," *Solar Energy*, 85(11), 2845-2855, 2011.
17. Miljkovic, N., Enright, R., Maroo, S.C., Cho, H.J., and E.N. Wang, "Liquid Evaporation on Superhydrophobic and Superhydrophilic Nanostructured Surfaces," *Journal of Heat Transfer*, 133(8), 080903, 2011.
18. Xiao R. and E.N. Wang, "Microscale Liquid Dynamics and the Effect on Macroscale Propagation in Pillar Arrays," *Langmuir*, 27(17), 10360-10364, 2011.
19. Humplik, T., Lee, J., O'Hern, S.C., Fellman, B.A., Baig, M.A., Hassan, S.F., Atieh, M.A., Rahman, F. , Laoui, T., Karnik, R., and E.N. Wang, "Nanostructured materials for water desalination," *Nanotechnology*, 22(29), 292001, 2011.
20. Veeraragavan, A., Lenert, A., Yilbas, B., Al-Dini, S., and E.N. Wang, "Analytical Model for the Design of Volumetric Solar Flow Receivers," *International Journal of Heat and Mass Transfer*, 55(4), 556-564, 2012.

21. Lenert, A. and E.N. Wang, "Optimization of Nanofluid Volumetric Receivers for Solar Thermal Energy Conversion," *Solar Energy*, 86(1), 253-265, 2012.
22. Miljkovic, N. Enright, R., and E.N. Wang, "Effect of Droplet Morphology on Growth Dynamics and Heat Transfer during Condensation on Superhydrophobic Nanostructured Surfaces," *ACS Nano*, 6(2), 1776-1785, 2012.
23. McCarthy, M., Gerasopoulos, K., Enright, R., Culver, J.N., Ghodssi, R., and E.N. Wang, "Biotemplated Hierarchical Surfaces and the Role of Dual Length Scales on the Repellency of Impacting Droplets," *Applied Physics Letters*, 100(26), 263701, 2012.
24. Miljkovic, N., Enright, R., and E.N. Wang, "Liquid Freezing Dynamics on Hydrophobic and Superhydrophobic Surfaces," *Journal of Heat Transfer*, 134(8), 08090, 2012.
25. Chu, K.H., Enright, R., and E.N. Wang, "Structured Surfaces for Enhanced Pool Boiling Heat Transfer," *Applied Physics Letters*, 100(24), 241603, 2012.
26. Peters, T.B., McCarthy, M., Allison, J., Dominguez-Espinosa, F. A., Jenicek, D., Kariya, H.A., Staats, W.L., Brisson, J.G., Lang, J.H., and E.N. Wang, "Design of an Integrated Loop Heat Pipe Air-Cooled Heat Exchanger for High Performance Electronics," *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 2(10), 1637-1648, 2012.
27. Enright, R., Miljkovic, N., Al-Obeidi, A., Thompson, C.V., and E.N. Wang, "Superhydrophobic Condensation: The Role of Length Scale and Energy Barriers," *Langmuir*, 28(40), 14424-14432, 2012.
28. Raj, R., Enright, R., Zhu, Y., Adera, S., and E.N. Wang, "A Unified Model for Contact Angle Hysteresis on Heterogeneous and Superhydrophobic Surfaces," *Langmuir*, 28(45), 15777-15788, 2012.
29. A. Lenert, Y. Nam, and E.N. Wang, "Heat Transfer Fluids," Book Chapter in *Solar Thermal Challenges Volume*, *Annual Review of Heat Transfer*, 15(15), 93-129, 2012.
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38. McKay, I.S., and E.N. Wang, "Thermal Pulse Energy Harvesting," *Energy*, 57(1), 632-640, 2013.
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44. Kariya, H.A., Peters, T.B., Cleary, M., Hanks, D.F., Staats, W., Brisson, J., and E.N. Wang, "Development and Characterization of an Air-Cooled Loop Heat Pipe with a Wick in the Condenser," *Journal of Thermal Science and Engineering Applications*, 6(1), 011010, 2013.

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51. Lenert, A., Bierman, D.M., Nam, Y.-S., Chan, W.R., Celanovic, I., Soljagic, M., and E.N. Wang, "A Nanophotonic Solar Thermophotovoltaic Device." *Nature Nanotechnology*, 9(2), p. 126-130, 2014.
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53. Humplik, T, Raj, R., Maroo, S.C., Laoui, T., and E.N. Wang, "Framework water capacity and infiltration pressure of MFI zeolites," *Microporous and Mesoporous Materials*, 190, p. 84-91, 2014.
54. Chou, J.B., Yeng, Y.W., Lenert, A., Rinnerbauer, V., Celanovic, I., Soljagic, M., Wang, E.N., S.-G. Kim, "Design of Wide-angle Selective Absorbers/Emitters with Dielectric Filled Metallic Photonic Crystals for Energy Applications," *Optics Express*, 22(1), p. 144-154, 2014.
55. Li, X., Michaelis, V.K., Ong, T.-C., Smith, S.J., McKay, I., Müller, P., Griffin, R.G., and E.N. Wang, "One-pot solvothermal synthesis of well-ordered layered sodium

aluminoalcoholate complex: a useful precursor for the preparation of porous Al₂O₃ particles," *CrystEngComm*, 16, p. 2950-2958, 2014.

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57. Li, X., Michaelis, V.K., Ong, T.-C., Smith, S.J., Griffin, R.G., and E.N. Wang, "Designed Single-step Synthesis, Structure, and Derivative Textural Properties of Well-ordered Layered Penta-coordinate Silicon Alcoholate Complexes," *Chemistry-A European Journal*, 20(21), p. 6315-6323, 2014.
58. Humplik, T., Raj, R., Maroo, S.C., Laoui, T., and E.N. Wang, "Effect of Hydrophilic Defects on Water Transport in MFI Zeolites," *Langmuir*, 22, p. 6446-6453, 2014.
59. Narayanan, S., and E.N. Wang, "Optimization of Adsorption Process for Climate Control and Thermal Energy Storage," *International Journal of Heat and Mass Transfer*, 7, p. 288-300, 2014.
60. Poesio, P and E.N. Wang, "Resonance Induced Wetting State Transition of a Ferrofluid Droplet on Superhydrophobic Surfaces," *Experimental Thermal and Fluid Science*, 57, p. 353-357, 2014.
61. Preston, D.J., Miljkovic, N., Sack, J., Queeney, J. and E.N. Wang, "Effect of Hydrocarbon Adsorption on the Wettability of Rare Earth Oxide Ceramics," *Applied Physics Letters*, 105(1), p. 011601, 2014.
62. Miljkovic, N., Preston, D.J., Enright, R., and E.N. Wang, "Jumping-droplet Electrostatic Energy Harvesting," *Applied Physics Letters*, 105(1), p. 013111, 2014.
63. Preston, D.J., Miljkovic, N., and E.N. Wang, "Jumping Droplet Electrostatic Charging and Effect on Vapor Drag," *Journal of Heat Transfer*, 136(8), p. 080909, 2014.
64. Raj, R., Adera, S., Enright, R., and E.N. Wang, "Polygonal Droplets on Microstructured Surfaces," *Journal of Heat Transfer*, 136(8), 2014.
65. Miljkovic, N., Preston, D.J., Enright, R., and E.N. Wang, "Ostwald Ripening During Freezing on Scalable Superhydrophobic Surfaces," *Journal of Heat Transfer*, 136(8), p. 080901, 2014.
66. Zhu, Y., Antao, D.S., Xiao, R., and E.N. Wang, "Real-Time Manipulation with Magnetically Tunable Structures," *Advanced Materials*, 26(37), p. 6442-6446, 2014.

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71. Chou, J.B., Yeng, Y.X., Lee, Y.E., Lenert, A., Rinnerbauer, V., Celanovic, I., Soljagic, M., Fang, N.X., Wang, E.N., and S.G. Kim, "Enabling Ideal Selective Solar Absorption with 2D Metallic Dielectric Photonic Crystals," *Advanced Materials*, 26(47), p.8041-8045, 2014.
72. Peles, Y., and E.N. Wang, Guest Editors, *Nanoscale and Microscale Thermophysical Engineering*, 18(3), 2014
73. Li, X., Narayanan, S., Michaelis, V.K., Ong, T., Keeler, E.G., Kim, H., McKay, I.S., Griffin, R.G., and E.N. Wang, "Zeolite Y adsorbents with high vapor uptake capacity and robust cycling stability for potential applications in advanced adsorption heat pumps," *Microporous and Mesoporous Materials*, 201, p. 151-159, 2015.
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76. Yang, S., Kim, H., Narayanan, S., McKay, I.S., and E.N. Wang, "Dimensionality Effects of Carbon-Based Thermal Additives for Microporous Adsorbents," *Materials and Design*, 85, p.520-526, 2015.
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