

Hyeongyun Cha

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

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EDUCATION

University of Illinois at Urbana-Champaign May 2019
Ph.D., Mechanical Engineering
Adviser: Nenad Miljkovic

University of Illinois at Urbana-Champaign May 2016
M.S., Mechanical Engineering
Adviser: Nenad Miljkovic

University of Illinois at Urbana-Champaign May 2014
B.S., Mechanical Engineering
Minor: Electrical Engineering

EMPLOYMENT

Energy Transport Research Laboratory Urbana-Champaign, IL
Graduate Research Assistant, Adviser: Nenad Miljkovic May 2015 - Present

- Coalescence-induced droplet jumping on the micro/nanostructured superhydrophobic surfaces for enhancement of phase change heat transfer, anti-icing, self-cleaning, and energy harvesting
- Development of a novel imaging platform for analysis of dynamic wetting processes
- Durable hydrophobic surfaces under a variety of realistic conditions including: phase change, thermal, and mechanical degradation

Department of Mechanical Science and Engineering Urbana-Champaign, IL
Teaching Assistant for Fundamentals of Fluid Dynamics (ME 310) Fall 2015
Teaching Assistant for Mechanical Design II (ME 371) Spring 2015
Grader for Mechanical Design II (ME 371) Spring 2014
Grader for Statics (TAM 210/211) Fall 2013

Littelfuse, Inc. Champaign, IL
Engineering Intern May 2014 - Dec. 2014

- Fabrication and testing of the industrial fuses for the solar power plant
- Fuse accessory design and fabrication
- Development of automatic manufacturing system and force testing method

Beckman Institute for Advanced Science and Technology Urbana-Champaign, IL
Undergraduate Research Assistant, Adviser: Joseph Lyding Jan. 2013 - May 2014

- Nanosoldering of locally heated carbon nanotube (CNT) junctions and graphene boundaries for elimination of nanoscale Joule heating for improved device performance
- Electrostatic transfer of monolayer graphene from copper foil

Logistics Command, Republic of Korea Air Force Daegu, South Korea
Sergeant July 2009 – Aug. 2011

- Translation of Technical Orders and documents for military aircrafts from English to Korean
- Recognized as a squad leader and led ~ 60 soldiers on daily tasks and duties in military unit

ACADEMIC EXPERIENCE

Illini EcoConcept (Fuel Cell Vehicle)

Senior Design Team

Urbana-Champaign, IL

Aug. 2013 - May 2014

- Carbon fiber body and Honeycomb fiberglass chassis design and fabrication
- Design and fabrication of A-arm and brake rotor for improved suspension system
- Heat treatment for tempered martensite spring bracket for brake pad retracting mechanism

Illini Formula Electric (Electric Vehicle)

High Voltage Team Member

Urbana-Champaign, IL

Aug. 2012 - May 2013

- Li-ion battery testing and Elithion Battery Management System installation
- High voltage battery pack with cooling system design and fabrication
- Shutdown and brake plausibility circuit design

SKILLS

Programming: Matlab, HTML & CSS, JavaScript, jQuery, C

Modeling: Pro/Engineer, Creo, Solidworks, Inventor, Abaqus, Working Model

AWARDS

Campus List of Teachers Ranked as Excellent by their Students

Fall 2015

PAPERS IN REFERED JOURNALS

- 1) H. Cha, C. Xu, J. Sotelo, J. M. Chun, Y. Yokoyama, R. Enright, and N. Miljkovic, "Coalescence-Induced Nanodroplet Jumping," *Physical Review Fluids*, **accepted**, 2016.
- 2) H. Cha, J. M. Chun, J. Sotelo, and N. Miljkovic, "Focal Plane Shift Imaging for the Analysis of Dynamic Wetting Processes," *ACS Nano*, **in press**, 2016.
- 3) S. Chavan, H. Cha, D. Orejon, K. Nawaz, N. Singla, Y.-F. Yeung, D. Park, D. H. Kang, Y. Chang, Y. Takata, and N. Miljkovic, "Heat Transfer through a Condensate Droplet on Hydrophobic and Nanostructured Superhydrophobic Surfaces," *Langmuir*, **32** (31), pp 7774-7787, 2016.
- 4) M. K. Kim, H. Cha, P. Birbarah, S. Chavan, C. Zhong, Y. Xu, and N. Miljkovic, "Enhanced Jumping-Droplet Departure," *Langmuir*, **31** (49), pp 13452-13466, 2015.
- 5) J. Do, N. N. Chang, D. Estrada, F. Lian, H. Cha, X. J. Duan, R. T. Haasch, E. Pop, G. S. Girolami, and J. W. Lyding, "Solution-Mediated Selective Nanosoldering of Carbon Nanotube Junctions for Improved Device Performance," *ACS Nano*, **9** (5), pp 4806-4813, 2015.

PAPERS AND PRESENTATIONS IN REFEREED CONFERENCE PROCEEDINGS

- 1) H. Cha, J. M. Chun, and N. Miljkovic, "Focal Plane Shift Imaging for the Analysis of Jumping-Droplet Condensation," Proceedings of the ASME Summer Heat Transfer Conference, Washington, DC, July 10-14, 2016.
- 2) H. Cha, C. Xu, J. M. Chun, M. Y. Ye, and N. Miljkovic, "Coalescence-Induced Water Nanodroplet Jumping on Superhydrophobic Surfaces," Proceedings of the ASME Summer Heat Transfer Conference, Washington, DC, July 10-14, 2016.
- 3) H. Cha, J. M. Chun, Y. Xu, and N. Miljkovic, "Multi-Droplet Coalescence-Induced Droplet-Jumping on Superhydrophobic Surfaces," Proceedings of the ASME Summer Heat Transfer Conference, Washington, DC, July 10-14, 2016.
- 4) H. Cha, J. M. Chun, J. Sotelo, and N. Miljkovic, "Focal Plane Shift Imaging for the Analysis of Jumping Droplet Condensation," Proceedings of the 17th International Symposium on Flow Visualization, Gatlinburg, Tennessee, June 19-22, 2016.
- 5) M. K. Kim, H. Cha, Y. Xu, C. Zhong, and N. Miljkovic, "Enhancing the Coalescence-Induced Jumping Droplet Velocity via Multi-Droplet Coalescence," Proceedings of the International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems Conference, InterPACK2015, San Francisco, CA, July 6-9, 2015.