CHUNG HOON LEE

Electrical and Computer Engineering
Marquette University
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Milwaukee, WI 53233

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expertise

Nanoscale devices, Thermal microfluidics, Molecular electronics, Micro-electromechanical systems (MEMS), Bio-MEMS, Ultrasonic actuators and sensors, and SPM / AFM probes

education

Ph.D. *1998–2002* The University of Wisconsin, Madison
Electrical and Computer Engineering

B.S. *Feb. 1998* Dongguk University (South Korea)
Physics

academic experience

Marquette University *2015–present* Associate Professor
Electrical and Computer Engineering

2007–2015 Assistant Professor
Electrical and Computer Engineering

2002–2007 Post-Doc
Electrical and Computer Engineering

B. Davaji, J. H. Han, and C.-H. Lee, "Microfabricated Calorimeter for Biosensing And Versatile Thermal Analysis," Advances in Microfluidics & Nanofluidics, AMN2013, Notre Dame, IN, USA, 2013

C.-H. Lee, "Fabrication and applications of Micro/Nanoscale devices," CMOS Emerging Technologies, Whistler, Canada, 2011 (invited talk)

J. H. Han, N. Yoshimizu, T. Cheng, M. Ziwisky, S. A. Bhave, A. Lal, and C.-H Lee, "Nano-electromechanical zero-dimensional freestanding nanogap actuator," Micro Electro Mechanical Systems (MEMS), 2011 IEEE 24th International Conference, Cancun, Mexico, pp. 1357-1360, 2011

T. J. Cheng, J. H. Han, M. Ziwisky, C.-H Lee, and S. A. Bhave, "6.4 GHz acoustic sensor for in-situ monitoring of AFM tip wear,"Micro Electro Mechanical Systems (MEMS), 2011 IEEE 24th International Conference, Cancun, Mexico, pp. 522-524, 2011

C. Jiang, N. Yoshimizu, J. H. Han, A. Lal, and C.-H Lee, "Electroluminescence from a freestanding integratable single ZNO dot," TRANSDUCERS, Beijing, China, 10.1109, 2011

C.-H Lee, C. S. Ritz, and M. G. Lagally, "Fabrication of and electrical measurements on integrated single-crystal silicon nanowires," 2008 MRS Fall Meeting, Boston, USA, 2008

C.-H. Lee, C. Ritz, and M. Lagally, "3-Dimensional Silicon-Germanium Quantum Dots on Freestanding Si Nanoribbon", Nanoelectronics Devices for Defense & Security conference, Crystal City, VA, 2007

prior to marquette

M. K. Araz, C.-H. Lee, and A. Lal, "Ultrasonic Separation in Microfluidic Capillaries," IEEE Ultrasonics, Ferroelectrics, and Frequency Control 50th Anniversary Joint Conference, Montréal, Canada, pp. 153–156, 2004

C.-H. Lee, H. Guo, S. Radhakrishnan, A. Lal, C. Szekely, T. A. McClelland, and A. P. Pisano, "A Batch Fabricated Rubidium-Vapor Resonance Cell for Chip-Scale Atomic Clocks," Proceedings of the Solid State Sensor and Actuator Workshop, Hilton Head Island, South Carolina, USA, pp. 23–26, 2004

P. G. Evans, P. P. Rugheimer, M. Roberts, and M. G. Lagally, C.-H. Lee, Y. Xiao, B. Lai, and Z. Cai, "Direct Synchrotron X-Ray Microdiffraction Measurements of Strain and Bending in Micromachined Silicon Devices," Proceedings of IMECE04, 2004 ASME International Mechanical Engineering Congress, Anaheim, California, USA, 2004

M. K. Araz, C.-H. Lee, and A. Lal, "Ultrasonic Separation in Microfluidic Capillaries," IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Symposium, Hawaii, USA, pp. 1066–1069, 2003

C.-H. Lee, and A. Lal, "Ultrasonically Modified Meniscus for Microfluidic Delivery," IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Symposium, Munich, Germany, 2002

C.-H. Lee, and A. Lal, "Low-Voltage High-Speed Ultrasonic Chromatography for Microfluidic Assays," Proceedings of the Solid State Sensor and Actuator Workshop, Hilton Head Island, South Carolina, USA, pp. 206–209, 2002

C.-H Lee, P. Rugheimer, A. Lal, and M. G. Lagally, "Controlled SiGe Quantum Dot growth on MEMS structures," 1st International Conference and School on Nanoscale Molecular Mechanics, Hawaii, USA, 2002

C.-H Lee, Y. Dong, and A. Lal, "A Glass-PZT Ultrasonic Microfluidics Platform," Proceedings of the μTAS 2001 Conference, Monterey, CA, USA, pp. 489–491, 2001

C.-H. Lee, and A. Lal, "Silicon Ultrasonic Horns for Thin Film Accelerated Stress Testing," IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Symposium, Atlanta, USA, pp. 867–870, 2001

C.-H. Lee, and A. Lal, "Integrated Optical Longitudinal Strain Sensor on a Micromachined Silicon Longitudinal Mode Transducer," IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Symposium, Lake Tahoe, USA, pp. 467–470, 1999

C.-H. Lee, and A. Lal, "Miniature Ultrasonic Transducers with Optical Strain Readout," Proceedings of SPIE, vol. 3878, pp. 238–244, Santa Clara, USA, 1999

C.-H. Lee, V. Kaajakari, and A. Lal, "Impact Testing of Silicon Micromachined Beams," Proceedings of SPIE, vol. 3875, pp. 80–86, Santa Clara, USA, 1999

patents

Pending **US 62/123,576** (2014) High Speed AFM Probes

Pending **US 14/230,876** (2014) B. Davaji and C.-H. Lee, "Calorimetric microfluidic chemical sensor" (supported by Marquette University)

US 61,844,902 (2013) A. K. Vutha, B. Davaji, C.-H. Lee, G. M. Walker, "M

microfuidics platform for real-time lead ions and bio-chemical sensing in water"

NSF DUE — *2013–2015* $10,000 (direct cost: $6,644)

Amit Lal (PI, Cornell University), Chung Hoon Lee (Co-PI), and Three others (Various University as Co-PIs), "Modular Nanoengineering for the Future of Bits and Bytes"

DARPA MTO — *2008–2013* $282,800 (direct cost: $213,632)

Clif Pollock (PI, Cornell University), Chung Hoon Lee (Co-PI), Three other Co-PIs, "Nano-Optical Tether System for Precision Nanowires (Tip-based Nanofab)"

NSF I/UCRC — *2010–2012* $85,000 (direct cost: $81,818)

Chung Hoon Lee (PI), "Micro-Calorimeter for Real-Time Water Quality Monitoring"

DoD Air Force — *2011–2012* $75,000 (direct cost: $64,934)

Agiltron Inc. (PI) and Chung Hoon Lee (Co-PI), "Germanium Quantum Dot-Silicon Nanowire Superlattices for Thermoelectric Applications"

DARPA MTO — *2010–2011* $133,561 (direct cost: $94,141)

Chung Hoon Lee (PI), "Nano-DSC Array for Sensor Applications"

DOE NREL — *2009–2010* $100,000 (direct cost: $100,000)

Chung Hoon Lee (PI) and Dave Klemer (Co-PI at UWM), "Ultra Efficient Si/SiGe Nanowire Thermoelectric Materials for Converting Waste Heat to Electrical Energy"

DARPA MTO — *2008–2009* $289,571 (direct cost: $274,201)

Chung Hoon Lee (PI) and Krish Krishnan (Co-PI, California State University at Fresno), "An absolute temperature sensors"

prior to marquette

Asylum Research Inc. — *2007–2008* $11,000 (direct cost: $11,000)

Chung Hoon Lee (PI), "SPM/AFM Probe developments and commercialization"

internal grants & contracts funded

Marquette Innovation and Entrepreneurship Fund — *2015–2018* $338,000, pending

Chung Hoon Lee (PI), Co-PIs: Dr. Kyuil Kim, and Hector Cavazos, "Development of advanced scanning probes for nanoscale imaging and manipulation (Marquette based start-up Company)"

COE Research Equipment Award — *2015–2016* $120,000

Chung Hoon Lee (PI), Co-PIs: Dr. Fabien J. Josse, Dr. John Borg, Dr. Raymond A. Fournelle, Dr. Casey Allen, Dr. James A. Rice, "Raman Spectroscope and Atomic Force Microscope"

COE Research Equipment Award — *2014–2015* $250,000

Chung Hoon Lee (PI), Fabien Josse (Co-PI), and James Richie (Co-PI), "Atomic Force Microscope, Raman spectroscopy, and MSA-500 Micro System Analyzers"

RRG *2012–2013* $6,000

Chung Hoon Lee (PI), “A ubiquitous Platform for atomically-defined fabrication of Nanoscale Devices”

Way Klingler Young Scholar Awards *2012–2013* $32,000

Chung Hoon Lee (PI), “A novel platform for electrical/optical investigation of isolated single molecules”

honors and awards

Awards

2014 The William and Nancy Stemper Edowed Faculty Scholars Fund (Marquette University)

2014 IEEE Poster Competition (Milwaukee Section) 1st & 2nd place

2013 Way Klingler Young Scholar Awards (Marquette University)

2013 IEEE Poster Competition (Milwaukee Section) 2nd place

2012 Regular Research Grant (RRG) Awards (Marquette University)

2007 Claude Laval Jr. Award for Innovative Technology and Research

2007 Won 2nd and 3rd place at the 5th 10K Business plan competition (California State University, Fresno)

2006 Coleman Fellowship

2003 Winner, Poster presentation Graduate Research Symposium (Cornell University)

2002 IEEE UFFC symposium, Winner of the student paper competition

2002 Winner at the G. Steven Burrill technology b001316366390506Tm[(ɹrills0013163668n04n963

student committee participation (ms. & ph.d. graduates)

Ph.D

Arnold Mensah-Brown (Dr. Fabien Josse) (2010)

JinJin Zhang (Dr. Fabien Josse) (2013)

Tao Cai (Dr. Fabien Josse) (2013)

Tiffany Cheng (Dr. Sunil Bhave, Cornell University) (2013)

Mohamad Sotoudegan (Dr. Stephen Heinrich) (2014)

MS.

John Vitale (Dr. James Richie) (2012)

Logan Berens (Dr. James Richie) (2012)

Robert Lenisa (Dr. Fabien Josse) (2013)

Tian Newman (Dr. Fabien Josse) (2013)

Meghna Saikia (Dr. Shri Joshi) (2013)

Michael McCarthy (Dr. Fabien Josse) (2014)

Jude Coompson (Dr. Fabien Josse) (2014)

undergraduate student projects

Memristor

Trevor Thiess, Randy Neu, John Langmyer, Derek Schwab, Brittney Rodriguez, Carlos Pena, and Vincenzo Alberico (2012)

Kellen Carey, Steven Celmer, Curtis Bader, Ruinan Zhang Ivan Cartagena Colon, Kyle Leary, Lucas Rutowski, (2014 - present)

Michael Bachmann (Memristor applications), (2015 - present)

Senior design

Home-brewed Scanning Tunneling Microscope (STM), Team: Trevor Thiess, Alexander Hodges, and John Jaeger (2014 - 2015)

courses taught

Undergraduate

ELEN 4430, Physical Principles Solid State Devices

ELEN

EECE 6995, Ind Study in Electrical & Computer Engineering

EECE 9994, Master Thesis

MEEN 9999, Doctoral Dissertation

university service activities

Committee participation

EECE Graduate Committee (2008-present)

EECE Open House Coordinator (