H. Arthur Kariya

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EDUCATION:

Massachusetts Institute of Technology Cambridge, MA

Doctor of Philosophy in Mechanical Engineering, July, 2012
Major/Minor: Thermal-fluidic sciences / Business strategy and entrepreneurship
Focus: Thermal management systems for electronics, liquid/vapor phase change, heat transfer, heat pipes
Thesis: *Development of an Air-Cooled, Loop-Type Heat Pipe with Multiple Condensers*
GPA: 5.0/5.0 (Major), 4.9/5.0 (Minor)

Master of Science in Mechanical Engineering, February, 2009
Focus: Automotive engines, lubrication, tribology, manufacturing processes
Thesis: *Development of a Multi-Regime Tribometer and Investigation of Zinc-Dialkyldithiophosphate-Based Tribofilm development in the Presence of Overbased Calcium Sulfonate*
GPA: 5.0/5.0

University of California, Berkeley Berkeley, CA

Bachelor of Science in Mechanical Engineering, January, 2005
Graduated with high honors
GPA: 3.9/4.0

EXPERIENCE: (technical experience listed first)

Massachusetts Institute of Technology Cambridge, MA

Post-Doctoral Associate and Research Associate, Device Research Laboratory (2009 – present)

- Collaborated with a team of multi-discipline engineers at MIT and Lockheed Martin in the development of a high-heat dissipation heat sink. Project funded by DARPA ($2+ million).
- Assumed sole responsibility for the testing and characterization of a vapor-liquid heat transfer cycle (heat pipe), which is the centerpiece of the heat sink. Full prototype confirmed to function as designed.
- Conducted analytical, computational and experimental thermal-fluidic analysis for operational characterization.
- Designed and fabricated a custom ultra-high-vacuum system for heat pipe evacuation and filling.

Research Assistant, Sloan Automotive Laboratory (2007 – 2009)

- Responsible for engine oil performance analysis in a consortium with multiple industrial partners.
- Developed a custom bench tester for lubrication-wear analysis, with in-situ laser-induced fluorescence.
- Demonstrated the wear-prevention effects of dispersant additives in engine oil.

Oscomp Systems (2012 – present) Boston, MA

Consultant

- Performed thermodynamic, heat transfer and lubrication analysis to design and predict the performance of a novel compressor for natural gas.

University of California, Berkeley (2004) Berkeley, CA

Undergraduate Research Project

- Conducted individual research on the Wankel rotary combustion engine.
- Studied the effects of flame quenching and apex seal blow-by on emissions. Comparison of these effects to those of similar-sized reciprocating engines.

SKILLS:

Computer: Solidworks, COMSOL Multiphysics, basic LabVIEW and MATLAB

Languages: Fluent in English and Japanese

Machinery: Experienced in custom fabrication (machining, welding) and in rebuilding mechanical systems, including combustion engines and high pressure and vacuum systems.

PUBLICATIONS

H.A. Kariya, T.B. Peters, J.G. Brisson and E.N. Wang, *Design and Characterization of a Planar Evaporator for a Multiple-Condenser Loop Heat Pipe.* International Journal of Heat and Mass Transfer (In preparation)

H.A. Kariya, T.B. Peters, M. Cleary, W.L. Staats, D.F. Hanks, J.G. Brisson and E.N. Wang, *Characterization of an Air-Cooled Loop Heat Pipe with a Wick in the Condenser.* International Journal of Heat and Mass Transfer (In preparation)

H.A. Kariya, T.B. Peters, M. Cleary, W.L. Staats, D.F. Hanks, J.G. Brisson and E.N. Wang, *Characterization of an Air-Cooled Loop Heat Pipe with Multiple Condensers.* International Journal of Heat and Mass Transfer (In preparation)

H.A. Kariya, T.B. Peters, M. Cleary, W.L. Staats, D.F. Hanks, J.G. Brisson and E.N. Wang, *Operation of a Heat Pipe with Dual-Mode Operation: Loop Heat Pipe and Capillary Pumped Loop.* Journal of Heat Transfer (In preparation)

T.B. Peters, M. McCarthy, J. Allison, F.A. Dominguez-Espinosa, D. Jenicek, H.A. Kariya, W.L. Staats, J.G. Brisson, J.F. Lang, 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, 2012 (Accepted for publication)

H.A. Kariya, W.L. Staats, D.F. Hanks, T.B. Peters, M. Cleary, J.G. Brisson and E.N. Wang, *Scaling of the Performance of an Air-Cooled Heat Pipe with the Addition of Multiple Modular Condensers,* Proceedings of IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, San Diego, CA, May 30-June 1, 2012.

T.B. Peters, H.A. Kariya, D.F. Hanks, W.L. Staats, J. Allison, D. Jenicek, M. Cleary, M. McCarthy, J.H. Lang, J.G. Brisson and E.N. Wang, *Fabrication and Characterization of a High-Performance Air-Cooled Heat Exchanger with an Integrated Multiple-Condenser Heat Pipe,* Proceedings of the Government Microcircuit Applications & Critical Technology Conference, Las Vegas, NV, Mar. 19-22, 2012.

H.A. Kariya, D.F. Hanks, T.B. Peters, J.G. Brisson and E.N. Wang, *Development and Characterization of a Loop Heat Pipe with a Planar Evaporator and Condenser,* Proceedings of the ASME International Mechanical Engineering Congress & Exposition, Denver, CO, Nov. 11-17, 2011.

M. McCarthy, T.B. Peters, J. Allison, A. Espinosa, D. Jenicek, H.A. Kariya, C. Koveal, J.G. Brisson, J.H. Lang and E.N. Wang, *Design and Analysis of High-Performance Air-Cooled Heat Exchanger with an Integrated Capillary-Pumped Loop Heat Pipe,* Proceedings of IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems, Las Vegas, NV, June 2-5, 2010.

H.A. Kariya, C. Koveal, M. McCarthy, J.G. Brisson and E.N. Wang, *Modeling a Loop Heat Pipe with a Capillary Wick in the Condenser,* Proceedings of ASME International Heat Transfer Conference, Washington DC, Aug. 8-13, 2010.

C. Koveal, T.B. Peters, H.A. Kariya, J. Allison, M. McCarthy, J.G. Brisson and E.N. Wang, *Design of Parallel Plate Condensers with Sintered Wicks for a Capillary-Pumped Loop Heat Pipe,* Proceedings of International Heat Pipe Conference, Clemson, SC, April 25-30, 2010.

H.A. Kariya, C. Koveal, J. Allison, M. Kelley, M. McCarthy, J.G. Brisson and E.N. Wang, *A Capillary-Pumped Loop Heat Pipe with Multi-layer Microstructured Wicks*, Proceedings of International Workshop on Micro and Nanotechnology for Power Generation and Energy Conversion Applications, Washington DC, Dec. 1-4, 2009.