

Biographical Sketch  
**JONAH H. LEE**  
Department of Mechanical Engineering  
University of Alaska Fairbanks, Fairbanks, AK 99775-5905  
(907) 474-5160; ffjhl@uaf.edu

**Education:**

Ph.D., 1983, Engineering Mechanics, Iowa State University  
M. Sc., 1979, Mechanical Engineering, South Dakota School of Mines and Technology  
B.S., 1973, Mechanical Engineering, Chung-Yuan Christian University, Taiwan

**Professional Experience:**

- 1998-2003, 2007-present Chair, Department of Mechanical Engineering, UAF
- 1984-present Assistant Professor, Associate Professor, and Professor of Mechanical Engineering, UAF
- 2004-2005 Program Officer, Division of Physical Sciences S&T, Office of Naval Research, Department of the Navy
- 2003-2004 Director, Engineering, Science and Technology Experiment Station, College of Science, Engineering and Mathematics, UAF
- 2001-2003 Deputy Director of Science and Technology, Chief Scientist, Center for Nanosensor Technology, UAF

**Research Interests:**

Applying theoretical, computational and experimental methods for the constitutive modeling of the plasticity, damage, failure, friction and wear of polymers, metals, ice, snow, foams, living cells and porous engineering materials; automotive engineering; vehicle-snow interaction; electronic packaging; network distributed and processor distributed computational methods; photomechanics; chemical-mechanical polishing.

**Professional Societies and Activities:**

American Association for the Advancement of Science; American Society of Mechanical Engineers; Materials Research Society; Society of Automotive Engineers; American Society of Engineering Education; Tire Society; International Society for Terrain-Vehicle Systems.

Reviewer for ASME Journal of Applied Mechanics, International Journal of Plasticity, International Journal of Numerical Methods in Engineering, International Journal of Solids and Structures, Experimental Mechanics, Acta Mechanica, ACM Journal, NSF Solid and Geo-Mechanics program, Engineering Materials and Processing program, NSF review panel for the Materials Engineering Program, DOE Basic Energy Program; Chairs of conference sessions.

**Recent Awards:**

- 2004: Defense Policy Fellowship from American Association for the Advancement of Science (AAAS)
- 2003: Meritorious bonus award of administration from College of Science, Engineering and Mathematics (CSEM), UAF
- 2002: Meritorious bonus award of research from Institute of Northern Engineering (INE), UAF

**Recent Grants:**

- “Automotive Research Center” Project led by University of Michigan, U.S. Army TARDEC

- “Modeling and Validation of Military Hybrid Vehicle Performance”, U.S. Army Yuma Proving Ground
- “Low Temperature Research Center” Project led by Wayne State University, U.S. Army TARDEC

**Selected Courses Taught at UAF (19 total):**

- ES 331 Mechanics of Materials
- ME 334 Materials Science and Engineering
- ME 601 Finite Element Analysis
- ME 604 Experimental Mechanics
- ME 631 Advanced Mechanics of Materials
- ME 687 Arctic Materials Science and Engineering
- ME 693 Advanced Finite Element Analysis

**Selected Recent Publications:**

- Lee, J.H., “Longitudinal interfacial forces of the interaction of a treaded tire with snow”, Proceedings of SAE World Congress, Detroit, MI, April 2008, Paper #2008-01-1415.
- Lee, J.H., Liu, Q., “Modeling and simulation of in-plane and out-of-plane forces of pneumatic tires on fresh snow based on the finite element method”, Proceedings of ISTVS 2007, Fairbanks, Alaska, Paper #2007-73-0253.
- Li, L., Sandu, C., Lee, J.H., Liu, Q., “Development of tire-on-stochastic snow models using a polynomial chaos approach”, Proceedings of ISTVS 2007, Fairbanks, Alaska, Paper #2007-12-0408.
- Lee, J.H., Wang, W., “Characterization of snow cover for vehicle mobility using ground penetrating radar – experiments and modeling”, Proceedings of ISTVS 2007, Fairbanks, Alaska, Paper #2007-12-0307.
- Liu, Q., Lee, J.H., Guo, K., “Analysis of non-steady tire cornering properties based on string-concept deformation and geometric relationship of contact patch”, *SAE Transactions*, 2007, Also in Proceedings of SAE World Congress, Detroit, MI, April 2007, Paper #2007-01-1514.
- Li, J., Mourelatos, Z.P., Lee, J.H., Liu, Q., “Prediction of tire-snow interaction forces using metamodeling”, Proceedings of SAE World Congress, Detroit, MI, April 2007, Paper #2007-01-1511.
- Lee, J.H., Liu, Q., “Significance of Plate-Indentation Tests for Tire-Snow Interaction”, Proceedings of the 10<sup>th</sup> European Conference of the ISTVS, Budapest, Hungary, 2006, pp. 15.
- Lee, J.H., Liu, Q., Mourelatos, Z.P., “Simulation of Tire-Snow Interfacial Forces for a Range of Snow Densities with Uncertainty”, *SAE Transactions Journal of Materials and Manufacturing*, 2006, p. 408-418; Also in Proceedings of SAE World Congress, Detroit, MI, April 2006, Paper #2006-01-0497
- Lee, J.H., Liu, Q., “Interfacial Forces between Tire and Snow under Different Snow Depths”, SAE Paper #2006-01-0496 (2006)
- Liu, Q. and Lee, J.H., “Time-Dependent Tire-Snow Modeling for Two-Dimensional Slip Conditions”, *SAE Transactions Journal of Commercial Vehicles*, p. 112-121, 2006; Also in Proceedings of SAE World Congress, Detroit, MI, April 2006, SAE Paper #2006-01-1168.
- Xu, G., Liang, H., Lee, J.H., Goering, D., “Tribological Properties of Solid-Lubricating Coatings on Cylinder Bore at Low Temperatures”, *Wear*, **257** (2004) 59-65.
- Zhang, T.G. and Lee, J.H., A Plasticity Model for Cellular Materials with Open-Celled Structure, *International Journal of Plasticity*, **19** (2003) 749-770.
- Lee, J.H., Xu, H., Liang, H., Experimental and Numerical Analysis of Friction and Wear Behavior of Polycarbonate, *Wear* **251** (2001) 1541-1557.
- Lee, J.H., Oung, J., Yield Functions and Flow Rules for Porous Pressure-Dependent Strain-Hardening Polymeric Materials", *ASME Journal of Applied Mechanics*, 67 (2000) 288-297.
- Lee, J.H. and Zhang, Y., “A finite-element work-hardening plasticity model of the uniaxial compression and subsequent failure of porous cylinders including effects of void nucleation and growth Part II: Localization and Fracture Criteria. *ASME Journal of Engineering Materials and Technology*. **118** (1996), 169-178.