

DANIEL J. LASER

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Education **Stanford University**

Stanford, California

Candidate for Ph.D., Mechanical Engineering, June 2003.

Master of Science, Mechanical Engineering, June 2000.

- Coursework in microscale heat transfer and fluid flow, microfabrication technology, solid-state physics, public policy, embedded systems design, nonlinear systems theory, and biotechnology.
- GPA (classes): 3.6/4.0

Northwestern University

Evanston, Illinois

Bachelor of Science, Mechanical Engineering, June 1994.

Bachelor of Arts, Political Science, June 1994.

- Coursework focused on dynamic systems and controls.
- GPA: 3.4/4.0

Standardized tests GRE General Test: verbal–740 (99%); quantitative–800 (99%); analytical–760 (95%)

Academic experience **Stanford Micro Structures and Sensors Laboratory**

Stanford, California

September 1998–present

Fundamental and applied research in microelectromechanical systems (MEMS), microfluidics, and integrated circuit thermal management.

- Conceived and developed a novel electroosmotic micropump based on IC fabrication techniques using silicon substrates. Demonstrated performance superior to that of all other comparable micropumps. Studied fundamental physics of electroosmotic pumping by fabricating and testing micropumps with integrated sensors. Developed portable medical diagnostic devices and IC thermal management solutions incorporating arrays of micropumps.
- Worked with other researchers to develop a two-phase microcooler system for integrated circuits (currently being commercialized).
- Investigated transition to turbulence in microchannel fluid flow using micro particle image velocimetry for flow visualization.
- Developed packaging solutions for micromachined tunneling accelerometers.

Northwestern University Laboratory for Intelligent Mechanical Systems

Evanston, Illinois

June 1993–September 1994

Assisted in the design and development of a robotic surgical system.

- Evaluated alternative devices for user input to robot computer controller; interfaced prototype devices with controller.
- Evaluated feasibility of implementing force feedback in robot by designing and building a test mechanism utilizing a single linear screw actuator.
- Analyzed vibration characteristics of robot and supporting structure; evaluated alternative designs for supporting structure.

Industry experience	<p>Iolon, Incorporated San Jose, California <i>February 2001-May 2002</i> Engineering design and analysis of a tunable external cavity laser based on microelectromechanical systems technology for an optical networking components start-up company. Developed analytical models of dynamic behavior of MEMS actuators; verified models experimentally and through finite element analysis with Pro/MECHANICA. Analyzed microstructural properties of actuators. Wrote codes for custom postprocessing of Pro/MECHANICA output files.</p>
	<p>Fenwick & West LLP Palo Alto, California <i>May 1995-August 1998</i> Provided financial and technology analysis services to clients of a prominent Silicon Valley law firm. Developed mathematical and spreadsheet models to support client decisionmaking in capital-raising transactions, mergers, and acquisitions. Performed technological and financial due diligence on behalf of clients in connection with public offerings and acquisitions. Developed a database of merger and acquisition activity in high technology industries and assessed trends in frequently contentious issues such as limitations on liability. Led seminars for lawyers and support staff on topics in financial analysis.</p>
	<p>Falcon Manufacturing Company Dublin, Pennsylvania <i>October 1994-April 1995</i> Responsible for various aspects of custom contract fabrication of metal and fiberglass components for light assembly process automation and chemical processing applications.</p>
	<p>Atlantic Richfield Company (ARCO CQC Kiln) (now part of BP Amoco) Wilmington, California <i>June 1992-August 1992</i> Plant engineer at a petroleum coke calcination facility. Designed and oversaw construction of a new cooling system for a sulfate scrubbing unit; determined specifications and selected components for a plant-wide \$100,000 storm system upgrade; assessed OSHA compliance issues.</p>
Misc. Skills	<p>Microfabrication techniques and processes: deep reactive ion enhanced etching, wet etching, low pressure chemical vapor deposition, evaporative metal deposition and liftoff, anodic bonding. Computer programming and applications: Matlab, c/c++, Pro/Engineer, Pro/Mechanica, ANSYS, SolidWorks, Vellum, Forth, MS Excel, MS Access, all common operating systems and word processors. Languages: Moderate proficiency in Russian and French.</p>
Awards and Honors	<p>Semiconductor Research Corporation Graduate Fellow (2000-2003) MacArthur Affiliate, Center for International Security and Cooperation (2001-2002) Stanford University Department of Mechanical Engineering Graduate Fellowship Engineering Merit Award (1998-1999) Northwestern University McCormick Undergraduate Research Program Award (1994) Dean's List, Northwestern University McCormick School of Engineering and College of Arts and Sciences National Merit Scholar Order of Omega, Northwestern University Northwestern University 1992 Engineering Design Contest—Second Place</p>

- Publications and Conference Papers** D.J. Laser, K.E. Goodson, J.G. Santiago, and T.W. Kenny, *High-Frequency Actuation with Silicon Electroosmotic Micropumps*, Technical Digest, 2002 Solid-State Sensors, Actuators, and Microsystems Workshop, Hilton Head Island, S.C., June 2-6 2002.
- D.J. Laser, K.E. Goodson, J.G. Santiago, and T.W. Kenny, *Impact of Pumping Surface Separation Distance on Micromachined Silicon Electroosmotic Pump Performance*, Proceedings of the 2001 ASME International Mechanical Engineering Congress and Exposition, New York, NY, November 11-16, 2001.
- D.J. Laser, S. Yao, C.-H. Chen, J. Mikkelsen, K. Goodson, J. Santiago, and T. Kenny, *A Low-Voltage Silicon Micromachined Parallel-Plate Electrokinetic Pump*, Proceedings of the 11th International Conference on Solid-State Sensors and Actuators (Transducers '01), Munich, Germany, June 10-14 2001.
- L. Zhang, S.S. Banerjee, J.-M. Koo, D.J. Laser, M. Asheghi-Roudheni, K.E. Goodson, J.G. Santiago, and T.W. Kenny, *A Micro Heat Exchanger with Integrated Heaters and Thermometers*, Proceedings of the 2000 Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC, June 4-8, 2000.
- R.M. Zeighami, D.J. Laser, M. Asheghi, S. Devasenathipathy, T.W. Kenny, J.G. Santiago, and K. E. Goodson, *Experimental Investigation of Flow Transition in Microchannels Using Micron-Resolution Particle Image Velocimetry*, Proceedings of the Seventh Intersociety Conference on Thermal and Thermomechanical Phenomena in Electron Systems (ITherm 2000), Las Vegas, NV, May 24-27, 2000.