

Evan C. Lemley

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EDUCATION

- **Ph.D. Mechanical Engineering**, University of Arkansas - Fayetteville, December 1996.
- **M.S. Mechanical Engineering** – Nuclear Systems Option, University of Arkansas - Fayetteville, December 1991.
- **B.A. Physics**, Hendrix College, Conway, Arkansas, June 1989.

EXPERIENCE

Associate Professor, Department of Physics and Engineering, University of Central Oklahoma, Edmond, OK August 2003 through present. Responsibilities include teaching engineering science courses, physics courses, and the development of a mechanical engineering laboratory. Serving as Director of the Engineering Physics Program with responsibilities that include advising engineering physics students, recruiting, and curriculum development. Serving as chair of departmental ABET Committee and in charge of compiling self-study in Fall 2005. Currently research areas include simulation of flow through porous media, heat transport in laser-irradiated tissue, unfolding neutron spectra, and fluid mechanics/heat transport in rotating systems.

Assistant Professor, Department of Physics and Engineering, University of Central Oklahoma, Edmond, OK August 1998 through August 2003.

Mechanical Engineer, Plant Services Department, Black & Veatch Consulting Engineers, Kansas City, MO June 1997 through August 1998. Duties included coding and debugging of coal power plant analysis software CQIM (Coal Quality Impact Model). Responsible for official communication with beta testers and users of CQIM, and for bug-tracking for CQIM 2.0. Design and implementation of Java application for intranet use to browse CQIM results database.

TEACHING DUTIES

The following courses are rotated through: Intro to Engineering, Engineering Computing, Statics, Dynamics, Strength of Materials, Thermal-Fluids Engineering I/II, Senior Design, Mechanical Engineering Lab, Computational Methods, Advanced Heat Transfer, Fluid Dynamics, Thermal Systems Design. Additionally, some lower level physics courses and labs.

RECENT/CURRENT RESEARCH ACTIVITIES

1. *Simulation of Flow Through Porous Media* – this project is in support of work at the University of Oklahoma sponsored in part by an Petroleum Research Fund grant (Dr. Dimitrios V. Papavassiliou, PI). I have been performing computational fluid dynamics simulations in support of a pore flow simulator called FTPM built at the University of Oklahoma. This collaboration began over one year ago and we have presented these results in a regional conference, and we are currently writing a manuscript to be submitted to an archival journal.
2. *Simulation and Experimental Study of Laser Irradiation of Tumors* – this project is in collaboration with Dr. Wei Chen at the University of Central Oklahoma. My role has been to support students, many of them undergraduates, in performing Monte Carlo simulations of laser energy deposition and heat diffusion through tissue; and in interpreting results of simulations and experiments related to this project. This collaboration is ongoing for the last several years and has resulted in several publications.
3. *Simulation of Micro Heat Exchangers* – I served as faculty committee member (along with Dr. Mauricio Sanchez as project director) for this senior project for an undergraduate student (T. Matt Collins) in the 2004-2005 academic year. The work focused on

producing flow profiles and temperature distributions in varying configurations of micro heat exchangers with channel widths from 100 μm to 1 mm. The models built by Matt serve as the groundwork for further study of micro heat exchangers.

4. *Experimental Investigation of Thermo-acoustic Generators* – I am serving as the faculty advisor for this senior project (along with Dr. Weldon Wilson as a committee member) in the 2005-2006 academic year for four undergraduate students. This project is focused on a parameter search to optimize the performance of thermo-acoustic generators, which are power devices that transform waste heat into sound energy which then may be used to generate power.

AWARDS

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- Member of the Sigma Xi Scientific Research Society (inducted Spring 1999)
- Department of Energy Traineeship, 1994 and 1995.
- T.D. Williamson Doctoral Fellowship, 1993-1994.
- Member of the Honor Society of Phi Kappa Phi (inducted 1991)

PUBLICATIONS

1. **Jared J. Crochet**, Surya C Gnyawali, Yichao Chen, Evan C. Lemley, Lihong V. Wang and Wei R. Chen, 2006: "Temperature Distribution in Selective Laser-Tissue Interaction," *Journal of Biomedical Optics*, 11(3), 034031.
2. **Christopher A. Bailey**, Thomas M. Cowan, Evan C. Lemley, and Wei R. Chen, 2004: "Optimization of Selective Hyperthermia," *Journal of Biomedical Optics*, 9 (3), 648-654.
3. Liu, V.G., **Crochet, J.J.**; Lemley, E.C.; Chen, W.R., 2004: "Simulation of Selective Photothermal Interaction with Dye Enhancement," *Proceedings of the SPIE - The International Society for Optical Engineering*, 5319 (1), 101-7.
4. V. G. Liu, T.M. Cowan, S.-W Jeong, S.L. Jacques, W.R. Chen, and E.C. Lemley, 2002 : "Selective Photothermal Interaction Using an 805-nm Diode Laser and Indocyanine Green in Gel Phantom and Chicken Breast Tissue," *Lasers in Medical Science*, 17 (4), 272 – 9.
5. **Enkh-Amgalan Dorjgotov**, Adviser: Evan Lemley, "A Proposed Solution of the Unfolding Problem," *Proceedings of the National Conference On Undergraduate Research (NCUR) 2002*, University of Wisconsin – Whitewater, April 24-27, 2002, Whitewater, Wisconsin.
6. E.C. Lemley and L. West, "A Monte Carlo Technique for Unfolding Neutron Spectra," *Transactions of the American Nuclear Society*, **85**, 228 (2001).

INVITED PRESENTATIONS

POSTER PRESENTATIONS

Fall 2005

Lemley, E., Papavassiliou, D.V., and H.J. Neeman, "Energy Losses in Dividing Flow and Three-Dimensional Simulation of Porous Media," Oklahoma Supercomputing Symposium 2005, Norman, OK, Oct. 4-5 (2005).

Fall 2001

Fluid Flow Visualization Using Soap Films. Colin Simmons and Evan Lemley, Department of Physics and Engineering, University of Central Oklahoma.

New Techniques in Neutron Spectrum Unfolding. Evan Lemley, Department of Physics and Engineering, University of Central Oklahoma.

Mathematical Modeling of Selective Laser-Tissue Interactions Using Monte-Carlo Simulations. Chris Bailey, Dr. Wei Chen, and Dr. Evan Lemley, Department of Physics and Engineering, University of Central Oklahoma.

Fall 2000

Reduced Group Technique for Neutron Spectral Unfolding. Chris Mackey, Dr. Evan Lemley, Research Day for Regional Universities, October 26, 2000, University of Central Oklahoma.

Monte Carlo Techniques for Neutron Spectral Unfolding. Dr. Evan Lemley, Research Day for Regional Universities, October 26, 2000, University of Central Oklahoma.

Fall 1999

Heat Transfer from a Rotating Fluid-Filled Cylinder, Ploynuan Ruanthai, Evan Lemley, and David Martin, Research Day for Regional Universities, October 8, 1999, University of Central Oklahoma.

Research Proposals Submitted and Funded Grants

2005

Simulation and Experimental Investigation of Energy Losses in Dividing Flow (Evan Lemley – PI), American Chemical Society Petroleum Research Fund, pending for \$49,993.

Summer Research Fellowship for *Contaminant and Heat Transport Code Modifications* as part of American Chemical Society Petroleum Research Fund Grant *Scalar Transport in Porous Media* (Dr. Dimitrios V. Papavassiliou, Univ. of Oklahoma -PI), pending for \$8000.

2004

Summer Research Fellowship for *Non-Plug Flow Code Modifications* as part of American Chemical Society Petroleum Research Fund Grant *Scalar Transport in Porous Media* (Dr. Dimitrios V. Papavassiliou, Univ. of Oklahoma -PI), funded for \$7500.

2002

An Analytical Model of Neutron Scattering in Calibration Facilities (Evan Lemley - PI), UCO Faculty Research Program, Jackson College of Graduate Studies and Research, funded for \$7575.

2001

Reduced Group and Monte Carlo Techniques for Neutron Spectral Unfolding (Evan Lemley - PI), UCO Faculty Research Program, Jackson College of Graduate Studies and Research, funded for \$6543.

Selective Laser-Photothermal Interaction: Monte Carlo Simulation and Experimental Determination of Temperature Distribution (Evan Lemley – Co-PI) College of Graduate Studies and Research, \$9930, funded for \$5,830.

Dye-Enhanced Selective Hyperthermia in Cancer Treatment (Evan Lemley - Co-PI), Department of Health and Human Services, \$118,075 (not funded).

2000

New Techniques for Neutron Spectral Unfolding, UCO Faculty Research Program, Jackson College of Graduate Studies and Research, funded for \$7500.

NSF CCLI Adaptation and Implementation – Engineering Laboratory Development and Implementation at the University of Central Oklahoma (with D.L. Martin), requested \$95,000 (not funded).

OCAST OARS Proof of Concept Grant – Heat Transfer from a Rotating Fluid Filled Vessel, (with D.L. Martin) submitted April 2000, requested \$78,000 (not funded).

Heat Transfer from a Rotating Fluid Filled Cylinder, (with D.L. Martin), UCO Faculty Research Program, Jackson College of Graduate Studies and Research, funded for \$2000.

1999

NSF CCLI Adaptation and Implementation – Engineering Laboratory Development and Implementation at the University of Central Oklahoma (with D.L. Martin), requested \$200,000 (not funded).