

## M. Pinar Mengüç

Department of Mechanical Engineering, University of Kentucky, Lexington, KY 40506-0503  
(Currently at CEEE, Ozyegin University, Altunizade, Istanbul, Turkey)

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### EDUCATION

Ph.D.: Purdue University, School of Mechanical Engineering, West Lafayette, IN, 1985.  
Dissertation Title: Modeling of Radiative Heat Transfer in Multidimensional Enclosures Using Spherical Harmonics Approximation. Advisor: Prof. R. Viskanta.

MSME/BSME: METU, Department of Mechanical Engineering, Ankara, Turkey, 1980 (with honors).

### EXTENDED EDUCATION:

Woods Hole Oceanographic Institute College Faculty Workshop, Woods Hole, MA, June 1992.

Laser Surgery Principles, Harvard University, Cambridge, MA, October 1998.

### INDUSTRIAL ACTIVITIES:

Founding member, and the CEO of the Synergetic Technologies, Inc., (STI) Lexington, KY.

### PROFESSIONAL EMPLOYMENT

1/1/2009- Present Ozyegin University at Istanbul, Turkey (on leave from UK)

7/1993 - Present Engineering Alumni Assoc. Professor of Mechanical Engr, University of Kentucky

9/1998 – 7/1999 Senior Research Fellow, Shriners Research Center, Harvard University/ Massachusetts General Hospital, Cambridge, MA

7/1988 - 6/1993 Associate Professor of Mechanical Engineering, University of Kentucky, Lexington, KY (received tenure in 1988).

### PROFESSIONAL ACTIVITIES (selected)

Editor-in-Chief, *J. of Quantitative Spectroscopy and Radiative Transfer*, (JQSRT) 2006-- ;AssocTE: 2002-2005.

Associate Technical Editor: *ASME Journal of Heat Transfer*, 1997-2000;

Chairman of International Symposia on Radiation transfer; *Radiation I* (1995), *Radiation II* (1997), *Radiation III* (2001), *Radiation IV* (2004), *Radiation V* (2007)

### AWARDS AND HONORS (selected)

Turkish Scientific and Technical Research Council Fellowship (1972-1980); University of Kentucky Presidential Special Faculty Incentive Award (1988-1990); Best Paper Award, ASME Heat Transfer Division (1994); ASME Fellow (1999); International Center for Heat and Mass Transfer Fellow (2002). Research and Development Magazine's 100 Most Significant Product award (Particle Characterization Equipment by the STI, Inc.), (2003).

### PUBLICATIONS (selected out of more than 200 journal and conference publications)

#### Books:

J.R. Howell, R. Siegel, M. P. Mengüç, *Thermal Radiation Heat Transfer*, 5<sup>th</sup> Edition, Taylor&Francis, 2010.

B.T. Wong, M. P. Mengüç, *Thermal Transport with Applications to Micro/Nanoscale Machining*, Springer, 2008.

#### Five Recent/Most Relevant to the proposed Research:

B P. Garudadri Venkata, M. M. Aslan, M. Pinar Mengüç, G. Videen, "Surface Plasmon Scattering Patterns of Gold Nanoparticles and 2D Agglomerates," *ASME J. of Heat Transfer*, Vol. 129, pp. 59-71; 2007

R. Charnigo, M. Francoeur, M. P. Mengüç, A. Brock, M. Leichter, C. Srinivasan, "Nanoparticle Characterization via Derivatives of Scattering Profiles," *J. of Optical Society of America A*, Vol. 24, no. 9, pp. 2578-2589, 2007.

M. Kozan, Jyothish Thangala, Rahel Bogale, M. Pinar Mengüç, Mahendra K. Sunkara, "In-Situ Characterization of Dispersion Stability of WO<sub>3</sub> Nanoparticles and Nanowires" *Journal of Nanoparticle Research*, Volume: 10 Issue: 4 Pages: 599-612 April 2008.

M. Francoeur, M.P. Mengüç, R. Vaillon, "Near-field radiative heat exchanges between two thin films supporting surface phonon-polaritons," *J. of Applied Physics*, Vol, 107 Issue: 3 Article Number: 034313, Feb 2010

M. Francoeur, M.P. Menguc, and R. Vaillon, Local density of electromagnetic states within a nanometric gap formed between two thin films supporting surface phonon-polaritons. *Journal of Physics-D: Applied Physics*, Volume: 43, Issue: 7, Article Number: 075501, Feb. 24 2010

#### Five Additional Papers:

- B.T. Wong, M. P. Mengüç, R.R. Vallance, "Sequential Nano-Patterning Using Electron and Laser Beams: A Numerical Methodology," *Journal of Computational Nanotechnology*, V. 3, p. 219, 2006.
- J. A. Sanchez and M. Pinar Mengüç, "Phase Change Phenomena during Electron-Beam Based Nanomachining: Molecular Dynamics Simulations," *Physical Review B*, V. 76. 224104 (1-11), 2007.
- M. Francoeur and M. P. Mengüç, "Role of the fluctuational electrodynamics theory in near-field radiative heat transfer," *Journal of Quantitative Spectroscopy and Radiative Transfer*, Vol. 109, pp 280-293, 2008.
- J.A. Sánchez, M. P. Mengüç, "Geometry dependence on the electrostatic and thermal response of a carbon nanotube during field emission." *Nanotechnology*, Article Number: 075702 February 20, 2008.
- B.T. Wong and Menguc, M.P., "A unified Monte Carlo treatment of transport of electromagnetic energy, electrons and phonons in absorbing and scattering media," *Journal of Quantitative Spectroscopy and Radiative Transfer*, Volume: 111, Issue: 3, Pages: 399-419, Feb. 2010

#### **INVITED LECTURES (selected)**

- "Particle Characterization Technique based on Elliptically Polarized Light Scattering," presented at NIST, June 03, 2002; Rice University, September 27, 2002; University of Missouri-Rolla, Rolla, MO January 23, 2002; Vanderbilt U., February 24, 2003; Koc University, Istanbul, Turkey, 2005
- "Nano-Scale Machining and Characterization," presented at Texas A&M University, Drexel University, Fresnel Institute, Marseille, France, Universidad de Cantabria, Santander, Spain; ESPOL, Guayaquil, Ecuador; University of Texas Austin; University of Tennessee; UCLA; Istanbul Technical University, Turkey; Clemson University, SC; The George Washington University (2006-2009)
- "Nanoscale Engineering: Impact on Economy via Education," presented at ESPOL Downtown Campus, Guayaquil, Ecuador. August 1, 2006; October 2008; Peking University, China, June 1, 2009.

#### **PATENTS**

- 1:** "Radiation Modulator Systems," Co-inventors: M. P. Mengüç, B. Walcott, M. Marra. US Patent Awarded August 25, 1998; #5,797,736; **2:** "Non-Intrusive Method and Apparatus for Characterizing Particles Based in Scattering Matrix Elements Measurements Using Elliptically Polarized Light," Co-inventors: M. P. Mengüç and S. Manickavasagam. US Patent Awarded on April 13, 2004; #6,721,051; **3:** "Nano-scale Machining with Carbon Nanotubes," Co-inventors: R. Vallance, A.R. Rao, M. P. Mengüç, US Patent Awarded on December 9, 2003; #6,660,959.

#### **GRANTS (selected/recent)**

- "NIRT: Staggered Probes for Integrating Nano Machining and Metrology," National Science Foundation-NIRT, \$1,000,000 (Currently PI, with Ryan Vallance, A. Rao, S. Jin, K. Javed), August 2002-December 2008.
- "Nano-Scale Engineering Education for Undergraduates at the University of Kentucky," NSF-NUE, \$130,000, January 2004 – December 2006, PI: M. Pinar Mengüç; co-PIs: R. Vallance, V. Singh, B. Hinds, Z. Chen.
- "Elliptically-Polarized-Surface-Wave-Scattering-Based Diagnosis of Self-Assembly and Nano-Fabrication," NSF-NER, \$130,000, July 2004-June 2006; PI: M.P. Mengüç; co-PIs: M. Aslan and B.J. Hinds.
- "Estimation of Analytic Surfaces with Applications to Nanoparticle Characterization via Surface Waves," Co-PI; PI. Richard Charnigo, co-PI, Cid Srinivisan, NSF, \$250,000, August 2007-July 2010.
- "Tip Directed-Assembly of Nanoparticles via Surface-Plasmon Excitation," NSF, \$500,000, May 2008-May 2011; coPI; PI: J. T. Hastings.

**GRADUATE STUDENTS AND POSTDOCTORAL ASSOCIATES:** (*out of twenty-five graduate, five post-doc, ten undergraduate students*). **Current:** Sethil Kumar (PhD); **Past (Related):** . B. Wong (Postdoctoral Fellow, PhD), M. Francoeur (Ph.D), D.K. Qing (Postdoc), S. Manickavasagam (Postdoc/Ph.D. student), Sarbajit Ghosal (Postdoc); M. Aslan (Post-doc/Research Professor); C. Crofcheck (Ph.D. Student), J.N. Swamy (PhD). M. Kozan (Ph.D), Jaime Sanchez (Ph.D), Illay Kunadian (Ph.D), Ellie Hawes (PhD), Brian Hawes (MS Student).

**COLLABORATORS:** Prof. R. Viskanta, Purdue; Prof. B. Webb, BYU; Prof. M. Toner, Harvard; Prof. R.R. Vallance, George Washington U., V. Singh, Z. Chen, B.J. Hinds, J. T. Hastings, J. Z. Hilt, F. Payne, C. Crofcheck, U. of Kentucky, Prof. A. M. Rao, Clemson University, Prof. S. Jin, UC-Sand Diego, Prof. J.R. Howell (UT-Austin).