

VITA

Marc L. Simpson

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PRESENT POSITION:

Distinguished Scientist, Sensor Science and Technology Group in the Measurement Science and Systems Engineering Division, Oak Ridge National Laboratory.

PREVIOUS POSITIONS:

Group Leader, Advanced Laser and Optical Technologies Group in the Instrumentation and Controls Division, Oak Ridge National Laboratory, 1990-2001.

Adjunct Professor, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville; teaching Junior and Senior-level courses in Electro-Optics and Digital Systems, 1989 through 1992.

EDUCATION:

Ph.D. Electrical Engineering, University of Virginia, Charlottesville, January 1988.

M.S. Engineering Science and Mechanics, University of Tennessee, Knoxville, August 1980.

B.S. Engineering Science and Mechanics, University of Tennessee, Knoxville, March 1980.

B.S. Biology and Biophysics, Trinity University, San Antonio, Texas, December 1975.

TECHNICAL SPECIALTIES:

Coherent Laser Radar Systems
Photonic Sensor Technology
Integrated Optical Devices and Components

PATENTS: 13 patents

Issued: "Nanocrystal Waveguide (NOW) Laser," J.T. Simpson, M.L. SIMPSON, S.P. Withrow, C.W. White, and, S.L. Jaiswal (6,853,669), February 2005.

"Narrowband Resonant Transmitter," D.P. Hutchinson, M.L. SIMPSON, and J.T. Simpson, (6,757,463), June 2004

"Sub-wavelength Efficient Polarization Filter (SWEP filter)," M.L. SIMPSON and J.T. Simpson, (6,661,692), December 2003.

"Reflective Coherent Spatial Light Modulator," J.T. Simpson, R.K. Richards, D.P. Hutchinson, M.L. SIMPSON, (6,552,842), April 2003.

"Transverse-longitudinal Integrated Resonator," D.P. Hutchinson, M.L. SIMPSON, J.T. Simpson, (6,532,326), March 2003.

"Dual Neutron Flux/Temperature Measurement Sensor," J.T. Mihalczko, M.L. SIMPSON, S.A. McElhaney, divisional patent (6,471,888), October 2002.

"Real-time Method and Apparatus for Measuring the Temperature of a Fluorescing Phosphor," C.L. Britton, D.L. Beshears, M.L. SIMPSON, S.W. Allison, and M.R. Cates, (5,986,272), November 1999.

"Real-time Method and Apparatus for Measuring the Decay-time Constant of a Fluorescing Phosphor," C.L. Britton, D.L. Beshears, M.L. SIMPSON, S.W. Allison, and M.R. Cates, (5,949,539), September 1999.

"Optical Wet Steam Monitor," L.C. Maxey and M.L. SIMPSON, (5,383,024), January 1995.

"Dual Neutron Flux/Temperature Measurement Sensor," J.T. Mihalczko, M.L. SIMPSON, & S.A. McElhaney, (5,352,040), October 1994.

"Light Operated Proximity Detector with Linear Output," M.L. SIMPSON and D.E. McNeilly (4,516,020), May 1985.

Licensed: "Phosphor Thermometry System," D.L. Beshears, D.N. Sitter, W.H. Andrews, M.L. SIMPSON, R.A. Abston, M.R. Cates, and S.W. Allison, (6,123,455), September 2000 to Bailey Engineering.

"Miniature Hybrid Optical Imaging System," D.N. Sitter and M.L. SIMPSON (5,680,252), October 1997 to Turtle Mountain Corporation.

AWARDS AND HONORS:

R&D 100 Award for "Galvanneal Temperature Measuring System," co-recipient, awarded 9/99.

Oak Ridge National Laboratory Technical Achievement Awards, awarded 5/99; 5/92.

American Museum of Science and Energy, 1998 Technology Award, "AISI Galvanneal Temperature Measurement System," co-recipient, awarded 5/98

Tennessee Society of Professional Engineers Outstanding Engineering Achievement Award for 1991 for on-line web stamp inspection system, co-recipient, awarded 2/92.

Martin Marietta Energy Systems Non-licensable Patent Award for "Unified Hyperthermia Probe for Cancer Treatment," awarded 12/5/89.

BOOK CHAPTERS

M.L. Simpson and D.P. Hutchinson, "Lidar," *Encyclopedia of Modern Optics*, edited by Robert D. Guenther, Duncan G. Steel, and Leopold Bayvel, Elsevier, Oxford, Vol. 2, pp. 169-178, 2004.

PUBLICATIONS: 38 refereed publications. Selected publications include:

M.L. SIMPSON, MD Cheng, T.Q. Dam, K.E. Lenox, J.R. Price, J.M. Storey, E.A. Wachter, and W.G. Fisher, "Intensity-modulated stepped frequency cw lidar for distributed aerosol and hard target measurements," *Applied Optics*, Vol. 44, No. 33, pp. 7210-7217, 20 November 2005.

M.R. Moore, J.A. Moore, S.F. Smith, M.L. SIMPSON, "GPS Risk and Risk Mitigation for FCS," *Proceedings Milcom 2003*, Boston, MA, paper no. 138, Oct. 13-16, 2003.

K.E. Lenox, A. Akerman, C.W. Ayers, T.Q. Dam, S. Goedeke, R.N. McGill, J.M. Storey, M. Cheng, R.K. Richards, M.L. SIMPSON, W.G. Fisher, E.A. Wachter, "Further Development of Remote Sensing Instrumentation for NO_x and PM Emissions from Heavy Duty Trucks," *Proceedings Air and Waste Management 96th Annual Conference*, paper no. 69731, June 22-26, 2003.

D.P. Hutchinson, R.K. Richards, J.T. Simpson, M.L. SIMPSON, "All Weather, Long Wavelength Infrared Free Space Optical Communications," *Proceedings SPIE Annual Meeting*, paper no. 4821-05, 2002.

M.L. SIMPSON, R.B. Dinwiddie, N.E. Clapp, B. Damiano, and M.J. Maston, "Dynamic IR Imaging of Nuclear Weapon Platforms for Treaty Verification," *Proceedings 41st Annual INMM Meeting*, New Orleans, LA, July 16-20, 2000.

M.L. SIMPSON, C.A. Bennett, M.S. Emery, D.P. Hutchinson, G.H. Miller, R.K. Richards, and D.N. Sitter, "Coherent Imaging Using Two-dimensional Focal-Plane Arrays: Design and Applications," *Applied Optics*, Vol. 36, No. 27, pp. 6913-6920, 20 September 1997.

M.L. SIMPSON, J.C. Miller, and D.H. Lowndes, "Laser Technology at the Oak Ridge National Laboratory," *Journal of Laser Applications*, Vol. 8, pp. 55-60, 1996. (Invited)

G.A. Armstrong and M.L. SIMPSON, "Designing a Custom VLSI Moment Invariant Data Signal Processor," *Computers Elect. Eng.*, Vol 19, No. 1, pp. 25-39, 1993.

M.L. SIMPSON and J.F. Jansen, "A New Approach to Imaging Colorimetry," *Applied Optics*, Vol 30, No 32, pp. 4666-4671, 10 November 1991.

M.L. SIMPSON, R.L. Schmoyer, M.A. Hunt, "Moment Invariants for Automated Inspection of Printed Material," *Optical Engineering*, Vol 30, No 4, pp. 424-430, April 1991.

- M.L. SIMPSON and R.D. Williams, "A Simple Design Methodology for Testing Flash A/D Converter Output Encoding," *IEEE Trans. on Instr & Meas.*, Vol. 37, No. 4, pp. 605-609, December 1988.
- M.L. SIMPSON and D.E. Welch, "Optoelectronic Strain Measurement System for Rotating Disks," *Experimental Mechanics*, Vol. 27, No. 1, pp. 37-43, March 1987.

MAJOR RESEARCH INITIATIVES:

- "Development of an Economically Attractive Gas Centrifuge Machine and Enrichment Process", USEC CRADA, \$30M, Lead Data Acquisition System Integrated Product Team, awarded October 2002.
- "Remote Emission Sensor Technology for Heavy Duty Truck Emissions," ORNL Laboratory Director's R&D Program, Co-Investigator, \$700K, awarded October 2001.
- "Beyond Copper (BCu): Advanced Materials and Structures for Optical Interconnects," ORNL Laboratory Director's R&D Program, Principal Investigator, \$700K, awarded October 1998.
- "Passive Infrared (IR) Imaging of Nuclear Weapons," DTRA, Principal Investigator, \$300K, awarded May 1998.
- "On-Line Process Control (OPCon)," Joint Laboratory-DOE initiative for textile fiber manufacturers under the American Textile (AMTEX) Partnership, DOE National Laboratory Project Manager, \$700K, awarded December 1994.
- "Coherent Infrared Imaging Camera (CIRIC)," ORNL Laboratory Director's R&D Program, Principal Investigator, \$795K, awarded October 1994.
- "Temperature Measurement of Galvanneal Steel," AISI and DOE Office of Industrial Processes CRADA, Co-Investigator, \$1.425M, awarded June 1992.
- "Widely Deployable Low-Cost Radiometer for the ARM Extended Observing Stations," DOE Office of Energy Research, Project Lead Engineer/Co-Investigator, \$1.113M, awarded November 1990.

INVITED LECTURES/SHORT COURSES:

- "Resonant Dust: IR Targets for Tagging and Identification," JASON Summer Study, La Jolla, California, June 21, 2001.
- "Resonant Dust: IR Targets for Tagging and Identification," NRO Technology Seminar Series, Reston, Virginia, January 23, 2001.
- "Laser Technology at the Oak Ridge National Laboratory," ICALEO '94, Orlando, Florida, October 17-20, 1994.
- "The Measurement of Color," University of Tennessee Measurement and Control Engineering Center, Web Inspection Special Interest Group, September 24, 1991.

PROFESSIONAL ACTIVITIES:

- Senior member IEEE
- Member, Science and Technology Advisory Board, Lightfleet Corporation, Camas, Washington (2007)
- Co-Chairman (2003), Co-Program Chair (2002), Tutorial Chair (2001), Program Committee (2000) – *IEEE Workshop on Interconnections within High Speed Digital Systems*, Santa Fe, New Mexico.
- Chairman – *DOE Workshop on Optical Interconnects for High Performance Computing*, Oak Ridge Tennessee, November 8-9, 1999.
- Chairman - *Optical Diagnostics for Manufacturing and Process Control Symposium*, Oak Ridge, Tennessee, held December 1 & 2, 1993.
- Steering Committee - *DOE UV-B Critical Issues Workshop*, Cocoa Beach, Florida, February 24-26, 1993.
- Session Chairman - *Optical Systems Session at 22nd Southeastern Symposium on System Theory*, Cookeville, Tennessee, held March 11-13, 1990.