

Lawrence L. Sutter

Professor
Michigan Technological University
Houghton, Michigan 49931

Michigan Tech Transportation Institute
(906) 487-2268
llsutter@mtu.edu

EDUCATION

Ph.D., Civil Engineering, Michigan Technological University, 2001.

Dissertation: "*An Approach to Characterizing Materials Related Distress in Portland Cement Concrete Pavements*".

Advisor: Dr. Thomas J. Van Dam.

M.S., Civil Engineering - Environmental Engineering Option, Michigan Technological University, 1995

Thesis: "*Characterization of Lead-Bearing Phases in Municipal Waste Combustor Fly Ash*"

Advisor: Dr. George R. Dewey.

B.S., Metallurgical Engineering - Mineral Processing Option, Michigan Technological University, 1991.

A.A.S., Electrical Engineering Technology, Ohio Institute of Technology, 1976

PROFESSIONAL EXPERIENCE

2007 – present Director, Michigan Tech Transportation Institute
2007 – present Director, University Transportation Center for Materials in Sustainable Transportation Infrastructure
2006 – present Professor, Michigan Tech Transportation Institute
2006 Professor, School of Technology, Michigan Technological University
2005 – 2006 Program Chair, Graduate Programs, School of Technology, Michigan Technological University
2004 – 2006 Program Chair, Construction Management, School of Technology, Michigan Technological University
2004 – 2006 Program Chair, Surveying Engineering, School of Technology, Michigan Technological University
2002 – 2006 Associate Professor, School of Technology, Michigan Technological University
2001 - present Adjunct Associate Professor, Department of Civil and Environmental Engineering, Michigan Technological University
1997 - 2002 Assistant Professor, School of Technology, Michigan Technological University
1995 - 1997 Instructor, General Engineering, Michigan Technological University
1992 - 1998 Consulting Engineer, Superior Analytical, Houghton MI
1979 - 1994 Engineer/Scientist/Instructor, Department of Metallurgical Engineering, Michigan Technological University
1976 - 1979 Field Service Engineer, Philips Electronic Instruments, Skokie IL
1975 - 1976 Lab Technician, Ohio Institute of Technology, Columbus OH

PROFESSIONAL AFFILIATIONS

International Cement Microscopy Association
American Society for Testing and Materials
American Concrete Institute
American Society of Civil Engineers
Microscope Society of America
Microbeam Analysis Society

CERTIFICATIONS

Michigan Concrete Technician - Level 1 - Michigan Concrete Association
Michigan Aggregate Inspector - Michigan Department of Transportation

UNIVERSITY SERVICE ACTIVITIES

2005 - 2007 Research Advisory Council, University Senate Representative
2005 - 2007 University Search Committee for Provost (2006-2007 Chair, 2005-2006 Associate Chair)
2004, 2005 University Senate President Candidate
2004 - 2007 University Senator At-Large
2004 - 2007 University Senate Executive Committee Member
2004 - 2007 University Senate Research Committee Chair
2002 - 2004 University Senate Representative to the Computer Executive Committee
2001 - 2002 Member of the Provost's Select Committee to Review the School of Technology
1998 - 2003 University Senator for the School of Technology
1998 - 2003 University Senate Research Committee Member
1998 - 2000 University Senate Liaison Committee on Intellectual Property Policy

RESEARCH FUNDING

1. National Cooperative Highway Research Program, \$749,125, “Specifications and Protocols for Acceptance Tests of Fly Ash Used in Highway Concrete”, Principal Investigator, 7/07 - 7/10
2. Wisconsin Department of Transportation, \$114, 938, “Reduction of Minimum Required Weight of Cementitious Materials in WisDOT Concrete Mixtures”, Principal Investigator, 10/07 - 10/09
3. Great Lakes Cement Promotion Association, \$45,000, Michigan Tech Concrete Initiative, Co-Principal Investigator, 9/07 - 8/08
4. Michigan Department of Transportation, \$304,826, “Impact of Hydrated Cement Paste Quality and Entrained Air-Void System on the Durability of Concrete”, Principal Investigator, 4/07 - 10/09
5. Michigan Department of Transportation, \$180,182, “Efficient Use of Recycled Concrete in Transportation Infrastructure”, Co-Principal Investigator, 4/07 - 4/09
6. Federal Highway Administration, \$2,450,000, “Alkali-Silica Reactivity (ASR) Development and Deployment Program”, Co-Principal Investigator, 1/07 - 1/10
7. Great Lakes Cement Promotion Association, \$35,000, Michigan Tech Concrete Initiative, Co-Principal Investigator, 9/06 - 8/07
8. United States Department of Transportation, \$2,000,000, “University Transportation Center for Materials in Sustainable Transportation Infrastructure”, 2006 Co-Principal Investigator, 2007 – Present Principal Investigator, 7/06 – 7/11,
9. Michigan Department of Transportation, \$350,000, “Evaluation of Concrete Pavements with Materials-Related Distress”, Principal Investigator, 12/05 - 5/07
10. Great Lakes Cement Promotion Association, \$45,000, Michigan Tech Concrete Initiative, Co-Principal Investigator, 9/05 - 8/06
11. Michigan Department of Transportation, \$250,000 per yr. min., Master Contract - Renewal of the MTU Transportation Materials Research Center (TMRC), Co-Principal Investigator, 9/05 - 8/08
12. WinEstimator Inc., \$71,245, \$0, Gift in Kind: Donation of 30 WinEST software licenses, Principal Investigator, 8/05
13. Innovative Pavement Research Foundation, \$175,977, Concrete Mixes and Pavement Construction for De-icing Facilities, Co-Principal Investigator, 9/04 - 3/06
14. Great Lakes Cement Promotion Association, \$35,000, Michigan Tech Concrete Initiative, Co-Principal Investigator, 9/04 - 8/05
15. South Dakota Department of Transportation, \$599,962, Investigation of the Long Term Effects of Magnesium Chloride and Other Concentrated Salt Solutions on Pavement and Structural Portland Cement Concrete, Principal Investigator, 9/03 - 9/06
16. Wisconsin Department of Transportation, \$199,965, Evaluation of Methods for Characterizing Air-Void Systems in Wisconsin Paving Concrete, Principal Investigator, 6/03 - 5/06
17. Michigan Department of Transportation, \$131,547, Mineral Characterization and Cataloging of Quarried Aggregate Sources Used in Michigan Highway Construction, Principal Investigator, 6/01 - 5/02
18. National Cooperative Highway Research Program, \$349,734, of “Early-Opening-to-Traffic” Portland Cement Concrete for Pavement Rehabilitation, Co-Principal Investigator, 2/00 to 3/02
19. National Science Foundation, \$724,654, Acquisition of Instrumentation for Microstructural Characterization of Materials that are Non-Conducting or Contain Volatile Phases, Co-Principal Investigator, 1/00 - 7/03
20. Conoco, \$50,000, Second Year Funding for the MTU Carbon Technology Center (CTC), Co-Principal Investigator, 12/99 - 12/00
21. Conoco, \$113,944, Demonstrating the Functionality of Carbon Fiber Modified Asphalt Mixtures—Phase I, Co-Principal Investigator, 1/99 - 12/99
22. Conoco, \$20,500, Demonstrating the Functionality of Carbon Fiber Modified Asphalt Mixtures—Phase 0, Co-Principal Investigator, 12/98 - 12/99

RESEARCH FUNDING (cont.)

23. Conoco, \$40,000, \$36,000, Establishment of the MTU Carbon Technology Center (CTC), Co-Principal Investigator, 12/98 - 12/99
24. Michigan Department of Transportation, \$257,558, A Study of Materials-Related Distress (MRD) in Michigan's PCC Pavements—Phase II, Co-Principal Investigator, 11/98 - 12/00
25. Michigan Department of Transportation, \$250,000 per yr. min. Master Contract, Establishment of the MTU Transportation Materials Research Center (TMRC), Co-Principal Investigator, 10/98 - 9/03
26. Michigan Department of Transportation, \$7,500, Preliminary Investigations of Deterioration of Fast-Setting Concrete Patches, Co-Principal Investigator, 4/98 - 9/98
27. MTU Faculty Dev. Grant, \$1,500, \$1,500, Novel Methods of Characterizing Materials Related Distress in Portland Cement Concrete, Principal Investigator, 3/98
28. Michigan Department of Transportation, \$124,135, A Study of Materials-Related Distress (MRD) in Michigan's PCC Pavements-Phase I, Co-Principal Investigator, 12/97 - 8/00
29. Federal Highway Administration, \$400,913, \$36,821, Detection, Analysis, and Treatment of Materials-Related Distress in Concrete Pavements, Co-Principal Investigator, 10/96 - 9/99
30. Michigan Department of Transportation, \$130,000, The Effect of Film Thickness on AC Durability, Co-Principal Investigator, 3/96 - 3/98
31. Federal Highway Administration, \$90,488, Effects of Higher Strength and Associated Concrete Properties on Pavement Performance, Co-Principal Investigator, 10/95 - 9/98

PUBLICATIONS/PRESENTATIONS

Journal Publications

1. Sutter, L.L., K.R. Peterson, S.H. Touton T.J. Van Dam, and D. Johnston (2006). "Petrographic Evidence Of Calcium Oxychloride Formation In Mortars Exposed to Magnesium Chloride Solution", *Cement and Concrete Research*, Volume 36, Issue 8, August, pp. 1533-1541.
2. Peterson, K.R., D. Gress, T.J. Van Dam, and L.L. Sutter (2006). "Crystallized Alkali- Silica Gel in Concrete from the Late 1890s", *Cement and Concrete Research*, Volume 36, Issue 8, August, pp. 1523-1532.
3. Carlson, J., L.L. Sutter, T.J. Van Dam, and K.R. Peterson (2006). "Comparison Of A Flat-Bed Scanner And The RapidAir 457 System For Determining Air-Void System Parameters Of Hardened Concrete," *Journal of the Transportation Research Board*, Transportation Research Record 1979, Transportation Research Board. pp. 60-68.
4. Sutter, L.L., T.J. Van Dam, K.R. Peterson, and D. Johnston (2006). "Long Term Effects of Magnesium Chloride and Other Concentrated Salt Solutions on Pavement and Structural Portland Cement Concrete – Phase I Results," *Journal of the Transportation Research Board*, Transportation Research Record 1979, Transportation Research Board. pp. 54-59.
5. Chen, Y., J. C. Crittenden, S. A. Hackney, L.L. Sutter, and D. W. Hand, (2005). "Preparation of a Novel TiO₂-Based p-n Junction Nanotube Photocatalyst," *Environmental Science and Technology*, 39 (5), 1201–1208.
6. Delem, L., T. Van Dam, K. R. Peterson, and L.L. Sutter, "Evaluation of Premature Deterioration of Concrete Bridge Barriers by Petrographic Examination", *Journal of the Transportation Research Board*, Transportation Research Record 1893, pp. 11-17, 2004.
7. Mitchell, D., G. Frohnsdorff, L.L. Sutter, et. al, "Service-Life Modeling and Design of Concrete Structures for Durability", *Concrete International*, December 2004, pp. 1-7.
8. Heiser, J.A., J.A. King, J.P. Konell, I. Miskioglu, and L. L. Sutter, "Tensile and Impact Properties of Carbon Filled Nylon 6,6 Based Resins", *Journal of Applied Polymer Science*, Vol. 91, 2004, pp. 2881-2893.
9. Heiser, J.A., J.A. King, J.P. Konell, and L. L. Sutter, "Shielding Effectiveness of Carbon Filled Nylon 6,6", *Polymer Composites*, Volume 25, Issue 4 , Pages 407 – 416.
10. Heiser, J.A., J.A. King, J.P. Konell, and L. L. Sutter, "Electrical Conductivity of Carbon Filled Nylon 6,6", *Advances in Polymer Technology*, Vol. 23, No.2, pp.135-146, 2004.
11. Hansen, K.F., T.J. Van Dam, K.R. Peterson, and L.L. Sutter "Effect of Sample Preparation on Chemical Composition and Morphology of Alkali-Silica Reaction Products," *Journal of the Transportation Research Board*, Transportation Research Record 1834, 2003, pp. 1-7.

Journal Publications (cont.)

12. Van Dam, T.J., K.R. Peterson, L.L. Sutter, and M.E. Housewright, "Study of Deterioration in Concrete Pavements Constructed with Slag Coarse Aggregate," *Journal of the Transportation Research Board*, Transportation Research Record 1834, 2003, pp. 8-15.
13. Sutter, L.L., K.R. Peterson, and T.J. Van Dam, "Using Epifluorescence Optical Microscopy to Identify the Causes of Portland Cement Concrete Distress: A Case Study," *Journal of the Transportation Research Board*, Transportation Research Record 1798, 2002, pp. 22-30.
14. Sutter, L.L., K.R. Peterson, T.J. Van Dam, and G.R. Dewey, "Laboratory Testing, Data Analysis, and Interpretation Procedures for Distressed Concrete Pavements," *Journal of the Transportation Research Board*, Transportation Research Record 1775, 2001, pp. 64-76.
15. Van Dam, T.J., N.J. Buch, K.F. Hanson, J. Hiller, L.L. Sutter, and R. Muethel, "Michigan's Approach to a State-Wide Investigation of Materials-Related Distress in Concrete Pavements," *Journal of the Transportation Research Board*, Transportation Research Record 1775, 2001, pp. 1-9.
16. Peterson, K.R., R.A. Swartz, L.L. Sutter, and T.J. Van Dam, "Air Void Analysis of Hardened Concrete with a Flatbed Scanner," *Journal of the Transportation Research Board*, Transportation Research Record 1775, 2001, pp. 36-43.
17. Burns, R.A., Crittenden, J.C., Hand, D.W., Selzer, V.H., Sutter, L.L., Salman, S.R., "Effect of Inorganic Ions in Heterogeneous Photocatalysis of TCE", *ASCE Journal of Environmental Engineering*, January 1999 Vol. 125 (1), pp. 77-85.
18. Sandell, J.F., G.R., Dewey, L.L., Sutter, J.A., Willemin, "Evaluation of Lead Bearing Phases in Municipal Waste Combustor Fly Ash", *ASCE Journal of Environmental Engineering*, January 1996 Vol. 122 (1), pp. 34-40.
19. Willemin, J.A., C.C. Nesbitt, G.R. Dewey, Sandell, J.F., and L.L. Sutter, "Flow Injection Analysis of MWC Fly Ash Leaching Characteristics", *Journal of Air and Waste Management*, November 1995 Vol. 45 (11), pp. 871-876.
20. Sutter, L.L., "Metallurgical Examination of Copper Artifacts from 20KE20", *The Michigan Archeologist* Vol. 39, No. 3-4 (1993): pp. 166-170.
21. Mainwaring, P.R., Sutter, L.L., Kramer, R.S., Hwang, J. Y., "Improved Characterization of Materials by Integrated Image Analysis and Microanalysis Methods," 120th Annual TMS Meeting, New Orleans, Louisiana; *Journal of Metals*, November 1990, p. 62.

Reviewed Conference Proceedings

1. Van Dam, T.J., D. Gress, K.R. Peterson, L.L. Sutter, and T.J. Bates (2007), "Comparison of Field and Laboratory Concrete Exposed to Potassium Acetate Runway Deicer," *Proceedings of the First International Conference on Advances in Concrete*, September 19-21, Washington, D.C., pp. 389-402.
2. Sutter, L.L., K.R. Peterson, T.J. Van Dam. "Methods for Threshold Optimization for Images Collected from Contrast Enhanced Concrete Surfaces for Air-Void System Characterization", *Proceedings of the 11th Euroseminar on Microscopy Applied to Building Materials*, Porto, Portugal, June 5-8, 2007.
3. Van Dam, T. J., L.L. Sutter, and K.R. Peterson, "Getting it Right: Achieving Long-Life through Material Selection, Mix Design, and Construction," *Proceedings of the International Conference on Long-Life Concrete Pavements*, Chicago, IL, October 24-27, 2006. pp. 369-386.
4. Anderson, C. P., L. L. Sutter, D. N. Huntzinger, and J. S. Gierke, "Effects of Carbonation on the Mineral Composition of Cement Kiln Dust", *Proceedings of the Twenty-Ninth Conference on Cement Microscopy*, Quebec City, PQ, Canada May 20 -24, 2007, p. 442-471.
5. Peterson, K., L.L. Sutter, T. Van Dam, "Virtual Hardened Concrete Sample Exchange Program", *Proceedings of the Twenty-Ninth Conference on Cement Microscopy*, Quebec City, PQ, Canada May 20 -24, 2007, pp. 131-134.
6. Carlson, J.C., L.L. Sutter, K.R. Peterson, T.J. Van Dam. "An Update on Application of a Flat-Bed Scanner for Performing ASTM C 457", *Proceedings of the 27th International Conference on Cement Microscopy*, Victoria, B.C., Canada, April 24-28, 2005.
7. Sutter, L.L., K.R. Peterson, S.H. Touton T.J. Van Dam, and D. Johnston. "Petrographic Evidence Of Calcium Oxychloride Formation In Mortars Exposed To Magnesium Chloride Solution", *Proceedings of the 10th Euroseminar on Microscopy Applied to Building Materials*, Paisley, Scotland, June 22-25, 2005.

Reviewed Conference Proceedings (cont.)

8. Peterson, K.R., D. Gress, T.J. Van Dam, and L.L. Sutter. "Alkali-Silica Reaction In Concrete From The Late 1890's" , *Proceedings of the 10th Euroseminar on Microscopy Applied to Building Materials*, Paisley, Scotland, June 22-25, 2005.
9. Sutter, L.L., K.R. Peterson, T.J. Van Dam. "The X-Ray Microscope: A New Tool for Measuring the Density of Hardened Cement Paste", *Proceedings of the 9th Euroseminar on Microscopy Applied to Building Materials*, Trondheim, Norway, September 8-12, 2003.
10. Sutter, L.L., T.J. Van Dam, K.R. Peterson, and A. Ganguly, "The X-Ray Microscope: A New Tool for Determining Chloride Ion Diffusion in Hardened Concrete", *Proceedings of the Conference on Advances in Cement and Concrete*, Copper Mountain, Colorado, August 10-14, 2003.
11. Sutter, L.L., K.R. Peterson, T. J. Van Dam, "Applications of an X-Ray Analytical Microscope to the Analysis of Concrete." *Proceedings of the 25th International Conference on Cement Microscopy*, Richmond, Virginia. April 6-10, 2003.
12. Peterson, K.R., L.L. Sutter, T. J. Van Dam. "Air Void Analysis of Hardened Concrete with a High Resolution Flatbed Scanner." *Proceedings of the 24th International Conference on Cement Microscopy*, San Diego, California. April 8-11, 2002, pp. 304-316.
13. Hammerling, D., K.R. Peterson, L.L. Sutter, T. J. Van Dam, and G.R. Dewey, "Ettringite: Not Just in Concrete." *Proceedings of the 22nd International Conference on Cement Microscopy*, Montreal, Canada. April 30 to May 4, 2000, pp. 431-441.
14. Peterson, K.W., D. Hammerling, L.L. Sutter, T. J. Van Dam, and G.R. Dewey, "Oldhamite: Not Just in Meteorites," *Proceedings of the 21st International Conference on Cement Microscopy*, Las Vegas, NV, April 25-29, 1999, pp. 394-405.
15. Sutter, L. L., "Macro Programming with NIH Image for Implementing ASTM C 457", *Proceedings of the Twentieth Annual Meeting of the International Cement Microscopy Association*, 1998, pp. 382-393.
16. Sutter, L. L., P. Lehoux, G. R. Dewey "Composition Based Phase Distribution Analysis of Portland Cement Clinker", *Proceedings of the Nineteenth Annual Meeting of the International Cement Microscopy Association*, 1997, pp. 14-29.
17. Landon, D.B., L.L. Sutter, "The Place of Scientific Research in Historical Archaeology: An Example from the Ohio Trap Rock Mine Site", *Proceedings of the Society for Archaeology*, October 1994, Plenum Press.

Non-Reviewed Conference Proceedings

1. Sutter, L.L., G.R., Dewey, and J.F. Sandell "Characterization of Lead Bearing Phases in Municipal Waste Combustor Fly Ash", The Proceedings of the Microscopy Society of America, August 1996.
2. Dewey, G.R., L.L., Sutter, and J.F., Sandell "Reactivity Based Approach for Classifying Fly Ash", The Proceedings of the American Power Conference, April 1996, Chicago, Illinois.
3. Sutter, L.L., J.F. Sandell, and G.R Dewey, "Applications of Electron Microprobe and Mineral Liberation Analysis Techniques to Municipal Solid Waste Combustor Fly Ash", Proceedings of the International Symposium on Extraction and Processing for the Treatment and Minimization of Wastes, February 1994.

Recent Peer Reviewed Reports

1. Sutter, L.L., K.R. Peterson, and T.J. Van Dam (2007). "Investigation of the Long Term Effects of Magnesium Chloride and Other Concentrated Salt Solutions on Pavement and Structural Portland Cement Concrete," Final Report, South Dakota Department of Transportation, Pierre, South Dakota.
2. Sutter, L.L., K.R. Peterson, and T.J. Van Dam (2007). "Evaluation of Methods for Characterizing Air-Void Systems in Wisconsin Paving Concrete," Final Report, Wisconsin Department of Transportation, Madison, Wisconsin.
3. Van Dam, T.J., and L.L., Sutter (2006). "Concrete Mixes and Pavement Construction for De-icing Facilities", Final Report, Innovative Pavement Research Foundation.
4. Van Dam, T.J., K.R. Peterson, and L.L., Sutter (2004). "Preliminary Investigation of the Role of Bacteria in Concrete Degradation," Final Report, Michigan Department of Transportation. Lansing, MI. August, 2004.
5. Van Dam, T.J., L. Delem, K.R. Peterson, and L.L. Sutter (2003). "Causes and Cures for Cracking of Concrete Barriers: Final Report, TMRC-03-02," Michigan Department of Transportation, Lansing, MI.

Recent Peer Reviewed Reports (cont.)

6. Sutter, L.L., T.J. Van Dam, K.R. Peterson (2003). "Mineral Characterization and Cataloging of Quarried Aggregate Sources Used in Michigan Highway Construction," Final Report, Michigan Department of Transportation. Lansing, MI. December.
7. Van Dam, T.J., L.L. Sutter, N. Buch, and J. Sytsma, "Durability of 'Early-Opening-To-Traffic' Portland Cement Concrete For Pavement Rehabilitation," Final Report, NCHRP 18-04B, Prepared for the National Cooperative Highway Research Program, Washington, D.C., May 2002.
8. Van Dam, T.J., L.L. Sutter, K.D. Smith, M.J. Wade, K.R. Peterson, "Guidelines for Detection, Analysis, and Treatment of Materials-Related Distress in Concrete Pavements, Volume 1: Final Report", FHWA Contract No. DTFH61-96-C-00073, Prepared for the Federal Highway Administration, Turner-Fairbank Highway Research Center, McLean, VA, September, 2001.
9. Van Dam, T.J., L.L. Sutter, K.D. Smith, M.J. Wade, K.R. Peterson, "Guidelines for Detection, Analysis, and Treatment of Materials-Related Distress in Concrete Pavements, Volume 2: Guidelines Description and Use", FHWA Contract No. DTFH61-96-C-00073, Prepared for the Federal Highway Administration, Turner-Fairbank Highway Research Center, McLean, VA, September, 2001.
10. L.L. Sutter, K.R. Peterson, Van Dam, T.J., K.D. Smith, M.J. Wade. "Guidelines for Detection, Analysis, and Treatment of Materials-Related Distress in Concrete Pavements, Volume 3: Case Studies Using the Guidelines", FHWA Contract No. DTFH61-96-C-00073, Prepared for the Federal Highway Administration, Turner-Fairbank Highway Research Center, McLean, VA, September, 2001.

Selected Oral Presentations (not shown above)

INVITED "Deicing Chemicals and Possible Effects on Portland Cement Concrete", Presented at the 2007 Michigan Concrete Association Annual Meeting, Midland, MI, February, 2007

INVITED "Deicing Chemicals and Possible Effects on Portland Cement Concrete Pavements", Presented at the 2007 University of Minnesota Transportation Conference, St. Paul, MN, December, 2007

INVITED "Concrete Petrography Techniques", International Conference on Cement Microscopy, Panel Discussion on Sample Preparation for Concrete Petrography. Denver, CO, April, 2006

INVITED: "Concrete Petrography: A Sword, A Shield, or a Beacon of Truth?", Presented at the 2006 Michigan Concrete Association Annual Meeting, Troy, MI February, 2006.

INVITED: "Cement and Concrete Chemistry", a one day seminar presented to the Technical Advisory Panel, Dow Corning, Midland MI, January, 2006.

INVITED: "Cement and Concrete Technology", a one day seminar presented to the Technical Advisory Panel, Dow Corning, Midland MI, May, 2005.

INVITED: "Further Development of a Flat-Bed Scanner for Determining Air-Void System Parameters of Hardened Concrete", Presented to the Society of Concrete Petrographers Annual Meeting, June, 2005, Reno, NV.

"The Role of Scanning Electron Microscopy in Concrete Petrography", Presented at the *Symposium on Techniques for Concrete Petrography*, ASTM Spring meeting 2005, June, Reno, NV.

INVITED: "Use of a High Resolution Flatbed Scanner to Determine the Air Content of Hardened Concrete" Presented to the Norwegian Geological Survey, Trondheim, Norway, May, 2004.

INVITED: "The X-ray Microscope: A New Tool for Materials Characterization" Presented to the Norwegian Geological Survey, Trondheim, Norway, May, 2004.

INVITED: "Materials Related Distress in Concrete Pavements", Presented at the 2004 Michigan Concrete Association Annual Meeting, Grand Rapids, MI February, 2004.

INVITED: "Emerging Microscopy and X-Ray Analytical Techniques for Characterizing the Microstructure of Portland Cement Concrete" Purdue University, Department of Civil Engineering, October, 2003

INVITED: "Field Testing of Fresh Portland Cement Concrete ", Presented at the LTAP Bridge and Culvert Conference, Marquette MI, September, 2002

INVITED: "Air-Void Analysis of Hardened Concrete with a High-Resolution Flatbed Scanner". Presented at the Symposium on Methods for Evaluation of Hardened Field Concrete sponsored by ASTM, Miami Fl., December 2002

Selected Oral Presentations (cont.)

INVITED: - A Systematic Approach to Characterizing Materials Related Distress in Portland Cement Concrete Pavements. Presented at the Symposium on Methods for Evaluation of Hardened Field Concrete sponsored by ASTM, Miami, FL., December 2002

INVITED: "New Techniques for Characterizing Transportation Construction Materials", Presented at the 2001 Transportation Materials Research Center Conference, Houghton, MI, October 2001

INVITED: "Field Distress Survey, Sampling Procedures, Laboratory Testing, Data Analysis, and Interpretation Procedures for Distressed Concrete Pavements," Presented to the Transportation Research Board Committee for Research on Improved Concrete Pavements, Irvine, CA, June, 2001

INVITED: "Data Interpretation and Diagnosis of Deteriorated Concrete Pavements," Presented at the January 2001 Annual Meeting of the Transportation Research Board, "*Workshop on Investigative Techniques for Assessing Concrete Durability Problems: State-of-the-Practice*", Washington D.C., 2001

INVITED: "Guidelines for Laboratory Tests Used to Characterize Materials Related Distress in Portland Cement Concrete Pavements", Presented at the 1999 Transportation Materials Research Center Conference, Houghton, MI, October 1999

INVITED: "Transportation Materials Research at MTU", presented to the Michigan County Engineers Workshop. Sponsored by the Michigan Local Technical Assistance Program, Houghton MI April, 1999

INVITED: Panel Discussion: "Automated Methods of Analyzing Concrete", Twentieth Annual Meeting of the International Cement Microscopy Association, April, 1998, Guadalajara, Mexico

STUDENTS ADVISED

Ph.D. Students Advised

Karl Peterson, Civil& Environmental Engineering, (expected graduation May 2008)
Melanie Kueber, Civil& Environmental Engineering, (expected graduation May 2010)

M.S. Students Advised

Matthew King, Civil& Environmental Engineering, (expected graduation May 2008)
Jacob Vermillion, Civil& Environmental Engineering, (expected graduation December 2008)
Jacob Fall, Civil& Environmental Engineering, (expected graduation December 2008)
Jeremy Carlson, Civil& Environmental Engineering, Spring 2005
Sayward Touton - Civil& Environmental Engineering, December, 2004
Megan Housewright – Civil& Environmental Engineering, December, 2003
Angela Matelski - Geological Engineering, Spring, 2002

Ph.D. Committees Served

Charlotte Jeltama, Chemical Engineering, 2007
Debra Huntzinger, Geological Engineering, 2006

M.S. Committees Served

Cecilia Anderson, Geological Engineering, 2006
Melzar Coulter, Civil& Environmental Engineering, 2005
Anirban Ganguly, Civil& Environmental Engineering, 2003
Andrea Johnson, Materials Science& Engineering, 2002
Karl Hansen, Civil& Environmental Engineering, 2001
Jon Sytsma, Civil& Environmental Engineering, 2001
Dorit Hammerling, Civil& Environmental Engineering, 2000
Emily Aldrich, Civil& Environmental Engineering, 2000

COURSES TAUGHT

GN120	Computer Applications and Visualization	CET3252	Water & Wastewater Technology
CET254	Contracts and Specifications	CET3000	Building Materials & Methods
EMT242	Engineering Materials	CET3100	Building Mechanical & Electrical Systems
CET1000	Public Speaking & Group Leadership	CET4100	Construction Equipment Management
CET1100	Introduction to Computer Applications	MY442	Scanning Electron Microscopy
CET1141	Cemented Aggregate Mixtures		
CET2251	Soils in Construction		

PATENTS

U.S. Patent # 4,916,719

Patent Date: April 10, 1990

Title: "On-line Analysis of Ash Containing Slurries"

Investigators: S.K. Kawatra, L.L. Sutter, T.C. Eisle

REVIEW PANELS

Journal of the Transportation Research Board

Journal of ASTM International

Cement, Concrete, and Aggregates Journal Environmental Science and Technology

Journal of Geotechnical and Geoenvironmental Engineering

ASCE Journal of Geotechnical and Geoenvironmental Engineering

Proceedings of the International Cement Microscopy Association (Editor)

Proceedings of the Euroseminar on Microscopy Applied to Building Materials

HONORS

2006 - First Runner-Up: Editors Choice Award for Environmental Technology Paper of the Year of 2005

2005 - Named to MTU Academy of Teaching Excellence

2005 - Nominated for Distinguished Teaching Award – Associate Professor

PUBLIC SERVICE

Continuing Education for Teachers

Aug/Sept. 2001 - Conducted training sessions to instruct Houghton Middle School science teachers on environmental electron microscopy and applications in K-12 education

August 2001 - Conducted electron microscopy laboratory sessions for participants in the Masters of Engineering program offered to high school teachers by Engineering Fundamentals

July 2001 - Conducted electron microscopy laboratory sessions for participants in the Internet 2 workshop offered for K-12 information technology personnel. Performed remote microscopy link with the University of Michigan

Women in Engineering/Summer Youth Programs

July 2007 – Provided instruction for Summer Youth Program students in applications of microscopy for forensic science

July 2001 - Conducted electron microscopy laboratory sessions for participants in the Women in Engineering studying Environmental Engineering

K-12 Outreach

2007

Served as Team Manager for Houghton 7th grade Destination Imagination team. *The team placed first in the U.P. regional competition and fifth in statewide competition*

Served as assistant Team Manager for the Houghton Middle School Lego League Team. *The team placed first in the U.P. regional competition and 16th in statewide competition*

Provided demonstrations and hands-on experience making concrete to three Houghton Elementary 4th grade classes, two Hancock Elementary 4th grade classes, and two Lake Linden Elementary 4th grade classes

2006

Served as Team Manager for Houghton Elementary 6th grade Destination Imagination team. *The team placed second in the U.P. regional competition and fifteenth in statewide competition*

Provided demonstrations and hands-on experience making concrete to two Houghton Elementary 4th grade classes

Provided demonstrations of electron microscopes at Michigan Tech for Houghton Elementary 6th grade science class

PUBLIC SERVICE (CONT.)

2005

Served as Team Manager for Houghton Elementary 5th grade Destination Imagination team. *The team placed first in the U.P. regional competition and seventh in statewide competition*

Provided demonstrations of various electron microscopes at Michigan Tech for Houghton Elementary 5th grade class

Provided demonstrations and hands-on experience making concrete to Houghton Elementary 4th grade class

Provided demonstrations of various electron microscopes at Michigan Tech for Houghton Elementary 4th grade class

2004

Conducted live demonstration of environmental scanning electron microscope for approximately 25 Houghton Elementary School students

Conducted a two-hour learning session for Houghton Elementary 4th grade students where basics of concrete were taught and students made and formed concrete

2003

Conducted live demonstration of environmental scanning electron microscope for approximately 65 Calumet Elementary School students

Conducted a two-hour learning session for Houghton Elementary third grade students where basics of concrete were taught and students made and formed concrete

2002

Conducted training sessions to instruct high school science teachers on environmental electron microscopy and applications in K-12 education

2001

Conducted live demonstration of environmental scanning electron microscope for approximately 65 Houghton Middle School students

Conducted training sessions to instruct Houghton Middle School science teachers on environmental electron microscopy and applications in K-12 education

Conducted electron microscopy laboratory sessions for participants in the Masters of Engineering program offered to high school teachers by Engineering Fundamentals

Conducted electron microscopy laboratory sessions for participants in the Internet 2 workshop offered for K-12 information technology personnel. Performed remote microscopy link with the University of Michigan

Other Community Service

2004 - 2007

Served as a Board Member of the Copper Country Suzuki Association. *Office Held: Vice-President*

2000 - 2004

Volunteer at Houghton Elementary School - performed entertainment and assist with Spring Art Show

Volunteer at Houghton Elementary School - performed entertainment, conduct reading groups, assist with Spring Art Show

2001

Dr. Sutter and students in his Spring 2001 CET3270 class investigated alternative materials for sidewalks in Houghton at the request of the West Houghton Neighborhood Association and the City of Houghton

1981 - present

Volunteer for Little Brothers- Friends of the Elderly - Work at holiday parties for elderly, deliver meals, participated as committee member on their recent Capital Campaign

CONSULTING

2006 - Dr. Sutter and Dr. Sid Diamond (Purdue) provided a one day seminar on Cement and Concrete Chemistry to the Technical Advisory Board of Dow Corning. The board is composed of academicians from Northwestern University, Harvard, MIT, Yale, and technical leaders from within Dow Corning

2005 - Dr. Sutter and Dr. Van Dam provided a one-day seminar on Cement and Concrete Technology to the Technical Advisory Board of Dow Corning. The board is composed of academicians from Northwestern University, Harvard, MIT, Yale, and technical leaders from within Dow Corning

2005 - Dr. Sutter served as an expert witness in a California litigation case regarding the use of scanning electron microscopy for the analysis of hardened concrete subject to sulfate attack

2005 - Provided technical expertise to Zak Dirt of Fort Collins, Colorado regarding magnesium chloride attack to sidewalks and other flatwork

2005 - Consulted with engineers and technicians at Cleveland Cliffs Mining on development of an automated iron-ore pellet testing instrument

2005 - Consulted with representatives of the Montana Department of Transportation regarding premature bridge-deck failures

2002 – present - Dr. Sutter has consulted with Applied Pavement Technology, Inc. over the last four years. Consulting has included investigations of materials-related distress on three airport projects that has resulted in one conference proceeding and financial support of the NC/VP laboratory

2004 - Provided a declaration in a class action suit in California regarding sulfate attack on concrete slabs on grade. The declaration focused on support of a specific method of determining the water to cementitious materials ratio of a hardened concrete. The law firm was Kasdan, Simonds & Epstein in Irvine, California

1995 – 1998 - Dr. Sutter presented numerous seminars on advanced applications of scanning electron microscopes (SEM) to materials and metallurgical engineering applications. Clients over the past seven years have included the University of Cincinnati, Argonne Labs (2 Seminars), Pacific Northwest Laboratories (Battelle Laboratories), University of Georgia, NASA Research at Huntsville Alabama, Air Force Research, San Antonio, TX , and Charles Evans Associates, San Francisco, CA. Topics presented include quantitative image analysis, electron microprobe analysis, and electron backscattered diffraction

PROFESSIONAL SERVICE

American Concrete Institute – Member of the task force to develop “The Roadmap to Sustainability for the Portland Cement and Concrete Industries”.

International Cement Microscopy Association (ICMA) - *Member* of Board of Directors, General Chairman Elect, *Editor*, Proceedings of the International Conference on Cement Microscopy

American Society for Testing and Materials (ASTM) - *Chairman*, C01.99/C09.99 Sub-committee on Research, *Chairman*, Task Group 2, Sub-Committee 9.24 Fly Ash ASTM C 618, Sub-*committees*: C01 Cement, C01.10 Hydraulic Cements for General Concrete Construction, C01.23 Compositional Analysis, C01.48 Performance of Cementitious Materials and Admixture Combinations, C01.99 Research, *Sub-committees*: C09 Concrete and Concrete Aggregates, C09.24 Supplementary Cementitious Materials, C09.27 Ground Slag, C09.48 Performance of Cementitious Materials and Admixture Combinations, C09.60 Testing Fresh Concrete, C09.65 Petrography, C09.66 Concrete's Resistance to Fluid Penetration, C09.98 Evaluation of Laboratories, C09.99 Research (Joint C09 and C01)