

CHRISTIAN J. SCHWARTZ, Ph.D., P.E.

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EDUCATION

Doctor of Philosophy, Mechanical Engineering, Iowa State University, 2006

- Dissertation: *Investigation of the performance of articular cartilage and synthetic biomaterials in multi-directional sliding motion as in orthopedic implants*

Master of Science, Mechanical Engineering, Iowa State University, 1998

- Thesis: *Effect of particle and transfer film characteristics on the wear of polyphenylene sulfide filled with micro and nanosized particles*

Bachelor of Science, Mechanical Engineering, Iowa State University, 1996

- Minor: Business Administration
- Graduation with Distinction

PROFESSIONAL LICENSES

Licensed Professional Engineer: State of Iowa, No. 16967
State of Texas, No. 90291 (inactive)

ACADEMIC AND INDUSTRIAL EXPERIENCE

Iowa State University, Ames, Iowa, 2012 to present

Associate Professor, Department of Mechanical Engineering

Courses:

- ME 325, Mechanical Component Design
- ME 416X, Mechanism Design and Synthesis

Associate Chair and Director of Undergraduate Studies, Department of Mechanical Engineering, 2013 to present

Responsibilities:

- Curriculum and schedule planning
- Chair of undergraduate curriculum committee
- Enrollment projection and strategic planning of program capacity increases
- Supervision of program support and academic advising staff

Texas A&M University (TAMU), College Station, Texas, 2006 to 2012
Assistant Professor, Department of Mechanical Engineering
Assistant Professor, Department of Biomedical Engineering

Courses:

- MEEN/ENGR 401, Introduction to Interdisciplinary Engineering Design
- MEEN 402, Intermediate Design, Studio
- MEEN 689, Tribology of Polymers and Biomaterials
- CVEN 305, Mechanics of Materials

Polymer Technology Center, Faculty member, 2006-2012

Biotechnology Program, Faculty member, 2006-2012

Institute for Innovation and Design in Engineering, 2006-2012

Materials Science and Engineering, Faculty member, 2007-2012

Iowa State University, Ames, Iowa, 1996 to 1998, 2003 to 2006

Research Assistant and Instructor, Department of Mechanical Engineering

Courses:

- Honors Seminar, From Ideas to iPods®: An Uncensored View of the Design Process and How It Has Shaped Our Society
- STAT 305, Engineering Statistics
- ME 321, Mechanical Behavior of Materials, Lecture and Laboratory

Southwest Research Institute® (SwRI®), Applied Physics Division, 1998 to 2003

Senior Research Engineer, 2002 to 2003

Research Engineer, 1998-2002

Key Responsibilities:

- Proposal writer, investigator, and manager of research and development projects
- Mechanical and systems designer for industrial and military applications
- One of the lead designers for the U.S. Marine Corps Mobility Denial System
- Designed nondestructive evaluation techniques for pipelines, railroads, aircraft
- Developed and marketed the *SwRI Process Monitoring Technology* venture

HONORS AND AWARDS

- National Science Foundation CAREER Award, 2012.
- Invited participant, Frontiers of Engineering Education (FOEE) Symposium, sponsored by the National Academy of Engineering, 2011
- Peggy L. and Charles L. Brittan '65 Teaching Award for Outstanding Undergraduate Teaching, 2009
- TAMU Student Led Award for Teaching Excellence (SLATE), 2009
- Big XII Faculty Fellowship, 2007.
- Iowa State University Research Excellence Award, 2006.
- National Science Foundation Graduate Research Fellow, 2004 to 2006.
- Attained Scholar status in Preparing Future Faculty, 2004.
- Miller Graduate Fellow, I.S.U., 2003 to 2006.

- Iowa State University Research Excellence Award, 1998.
- Kenneth P. Evans Memorial Award Recipient, 1996.
- I.S.U. Engineering Week Mechanical Engineering Student of the Year, 1995.

RESEARCH INTERESTS

Laboratory-based scholarship

- Biotribology
- Polymer tribology
- Skin tribology
- Tactual assistive technology for visual impairment
- Wear of biomaterials and the effects of wear debris *in vivo*
- Biomedical implant design
- Incorporation of naturally derived and biodegradable polymers in design

Classroom-based scholarship

- Problem-based and experiential learning pedagogy
- Criteria-based assessment and grading
- Development of interactive techniques to impart critical thinking and conceptual understanding of topics in undergraduate engineering education
- Incorporation of globalization concepts in engineering education
- Incorporation of service learning opportunities in engineering courses

Graduate Students Advised

With graduation date noted

- Christopher Call, MS, 8/08
- Kevin Plumlee, MS, 12/08
- David Dempsey, MS, 8/09
- Kalpana Kappagantula, MS, 12/09
- Richa Paliwal, MS, 12/10
- Carlos Guerra, MS, 12/10
- Joan Scaparra, MS, 12/10
- Matthew Darden, MS, 12/10; PhD 12/16
- Geetha Chimata, MS, 12/11; PhD 12/16
- Kevin Laux, MS, 5/12
- Jing Zhang, MS, 12/12
- Thomas Wilde, MS, 8/15

As committee member:

- Derek White, 2015, PhD, Mechanical Engineering (ME)
- Ramon Boudreaux, 2012, PhD, ME
- Jun-Hyeok Kim, 2010, MS, ME
- Chin-Fu Lee, 2012, PhD, ME
- Chung-Han Chiou 2012, PhD, ME

- Haiqing Yao, 2012, PhD, ME
- Roya Nezarati, 2012, PhD, ME
- Michael Kader 2012, MS, ME
- Jiwon Yu, 2012, PhD, ME
- Jack Wilson, 2012, MS, ME
- Yasaman Shirazi-Fard , 2012, PhD, Mat. Sci. & Engr. (MSEN)
- Biren Parmar, 2012, PhD, ME
- Dawei Zhang, 2012, PhD, ME
- Rodrigo Cooper 2011, PhD, MSEN
- Jacob Manuel, 2010, MS, ME
- Jeungwoo Joo, 2011, MS, MSEN
- Gao Feng, 2010, PhD, ME
- Zalak Purohit, 2010, MS, Industrial Distribution
- Fangzhou Feng, 2010, MS, ME
- Nicholas Cowen, 2010, MS, ME
- Ram Diwakaran, 2010, MS, ME
- Vincent Kostovich, 2009, MS, ME
- Joseph Midura, 2012, MS, Agricultural Engineering
- Matthew Lucas, 2009, MS, ME
- Scott Bouse, 2008, MS, ME
- Robert Browning, 2010, PhD, MSEN
- Graham Warren, 2008, MS, ME

PUBLICATIONS

Refereed (⁺ indicates advised students)

1. ⁺Wilde, T.J. and Schwartz, C.J.: "Parametric investigation of soft-body penetration into parallel-ridged textured surfaces for tactile applications," *International Journal of Solids and Structures*, 96 (2016), 393-399.
dx.doi.org/10.1016/j.ijsolstr.2016.05.013
2. ⁺Chimata, G.P. and Schwartz, C.J.: "Investigation of friction mechanisms in finger pad sliding against surfaces of varying roughness," *Biotribology*, 3 (2015), 11-19
doi:10.1016/j.biotri.2015.09.002
3. ⁺Darden, M.A. and Schwartz, C.J.: "Skin tribology phenomena associated with reading braille print: the influence of cell patterns and skin behavior on coefficient of friction," *Wear*, 332-333 (2015), 734-741. doi:10.1016/j.wear.2014.12.053
4. ⁺Chimata, G.P. and Schwartz, C.J.: "Investigation of the effect of the normal load on the incidence of friction blisters in a skin simulant model," *Proc. IMechE, Part J: Journal of Engineering Tribology*, 229 (2015), 266-272. doi:10.1177/1350650114535569
5. ⁺Laux, K.A. and Schwartz, C.J.: "Influence of Linear Reciprocating and Multi-Directional Sliding on PEEK Wear Performance and Transfer Film Formation," *Wear*, accepted for publication, 2012. <http://dx.doi.org/10.1016/j.wear.2012.12.004>

6. [†]Plumlee, K. and Schwartz, C.J.: "Investigation of surface layer plastic deformation in UHMWPE wear, and its relationship to the classic rippled surface phenomenon," *Wear*, accepted for publication, 2012. <http://dx.doi.org/10.1016/j.wear.2012.11.081>
7. [†]Laux, K.A. and Schwartz, C.J.: "Effects of contact pressure, molecular weight, and supplier on the wear behavior and transfer film of polyetheretherketone (PEEK)," *Wear*, 297 (2012), 919-925. <http://dx.doi.org/10.1016/j.wear.2012.11.013>
8. [†]Darden, M.A. and Schwartz, C.J.: "Investigation of friction mechanisms during the sliding of elastomers against hard parallel-ridge textures," *Tribology International*, available online, 1/31/2012. <http://dx.doi.org/10.1016/j.triboint.2012.01.005>
9. [†]Guerra, C. and Schwartz, C.J.: "Development of a Synthetic Skin Simulant Platform for the Investigation of Dermal Blistering Mechanics," *Tribology Letters*, 44 (2011), 223-228.
10. [†]Guerra, C. and Schwartz, C.J.: "Investigation of the Influence of Textiles and Surface Treatments on Blistering Using a Novel Simulant," *Skin Research and Technology*, 18 (2012), 94-100.
11. [†]Call, C.C and Schwartz, C.J.: "The Use of Weber Number to Predict Morphology in the Electrospinning of Poly(ethylene oxide) (PEO) Nanofibers," *Journal of Applied Polymer Science*, 120 (2011), 880-885.
12. [†]Plumlee, K. and Schwartz, C.J.: "Investigating UHMWPE Wear Mechanisms by Decomposing Wear Debris Distribution," *Wear*, 271 (2011), 2208-2212.
13. Froyd, J., Rajagopal, K., and Schwartz, C.J.: "Comprehensive Course Redesign: Introduction to the Mechanics of Materials," peer reviewed conference paper, *118th ASEE Annual Conference & Exposition*, Vancouver, British Columbia, June 25-29, 2011.
14. [†]Dempsey, D.K., Schwartz, C.J., Ward, R.S., Iyer, A.V., Parakka, J.P., Cosgriff-Hernandez, E.M.: "Micropatterning of Electrospun Polyurethane Fibers through Control of Surface Topography," *Macromolecular Materials in Engineering*, 295 (2010), 990-994.
15. [†]Plumlee, K. and Schwartz, C.J.: "Development of Porous UHMWPE Morphologies for Fixation of Gel-Based Materials," *Journal of Applied Polymer Science*, 114 (2009), 2555-2563.
16. [†]Darden, M. and Schwartz, C.J.: "Investigation of Skin Tribology and its Effects on the Tactile Attributes of Polymer Fabrics," *Wear*, 267(2009), 1289-1294.
17. [†]Plumlee, K. and Schwartz, C.J.: "Improved Wear Resistance of Orthopaedic UHMWPE by Reinforcement with Zirconium Particles," *Wear*, 267(2009), 710-717.
18. Schwartz, C.J, and Bahadur, S.: "Investigation of an Approach to Balance Wear Resistance and Mechanical Properties of Crosslinked UHMWPE," *Tribology Letters*, 34 (2009), 125-131.
19. Schwartz, C.J, Bahadur, S., and Mallapragada, S.: "Effect of Crosslinking and Pt-Zr Quasicrystal Fillers on the Mechanical Properties and Wear Resistance of UHMWPE for Use in Artificial Joints," *Wear*, 263(2007), 1072-1080.
20. Schwartz, C.J., and Bahadur, S.: "Investigation of Articular Cartilage and Counterface Compliance in Multi-Directional Sliding as in Orthopedic Implants," *Wear*, 262(2007), 1315-1320.
21. Schwartz, C.J., and Bahadur, S.: "Development and Testing of a Novel Joint Wear Simulator and Investigation of the Viability of an Elastomeric Polyurethane for Total Joint Arthroplasty Devices," *Wear*, 262(2007), 331-339.

22. Schwartz, C.J., and Bahadur, S.: "The Role of Filler Deformability, Filler-Polymer Bonding, and Counterface Material on the Tribological Behavior of Polyphenylene Sulfide (PPS)," *Wear*, 251(2001), 1532-1540.
23. Schwartz, C.J., and Bahadur, S.: "Studies on the Tribological Behavior and Transfer-Film-Counterface Bond Strength for Polyphenylene Sulfide Filled with Nanoscale Alumina Particles," *Wear*, 237 (2000), 261-273.
24. Schwartz, C.J., and Bahadur, S.: "Observations on the Grinding of Alumina with Variations in Belt Speed, Load, Sample Rotation, and Grinding Fluids," *Wear Processing in Manufacturing*, ASTM STP 1362, 1998, 13-28.

Book Chapters

- Schwartz, C.J., "Friction, Human Body: Skin," in Encyclopedia of Tribology, Wang, Q. and Chung, Y., eds., Springer, 2011.
- Bahadur, S., and Schwartz, C.J., "The Influence of Nanoparticle Fillers in Polymer Matrices on the Formation and Stability of Transfer Film during Wear," in Tribology of Polymeric Nanocomposites: Friction and Wear of Bulk Materials and Coatings, Friedrich, K. and Schlarb, A.K., eds., Elsevier B.V., Oxford, 2007
- Bahadur, S., and Schwartz, C.J., "The Tribological Behavior of Polymers filled with Inorganic Particulate Fillers," in Polymer Tribology, Sinha, S.K. and Briscoe, B.J., eds., World Scientific Publishing, Co., 2009.

Other

- Schwartz, C.J., and Light, G.M.: "Use of Magnetostrictive Sensor Technology for Detection of Transverse Defects in Rail," *Topics in Nondestructive Evaluation Series: Volume 5, Nondestructive Testing and Evaluation for the Railroad Industry*, American Society for Nondestructive Testing, Inc., 2002, 101-110.
- Schwartz, C.J., Sills, J.A., and Minachi, A.: "Increasing the Accuracy of Guided Wave Inspection Results Using Matched Filtering Techniques," *Review of Progress in Quantitative Nondestructive Evaluation*, 20A (2000), 563-570.

CONFERENCE PRESENTATIONS

1. ⁺Chimata, G. and Schwartz, C.J.: "The impact of tribological parameters on the display of tactile information," 2016 International Conference on BioTribology, London, UK, , September 11-14, 2016.
2. ⁺Chimata, G. and Schwartz, C.J.: "Development of Synthetic Skin Simulants to Estimate Skin Friction Damage: Design Considerations," poster presentation, 2016 STLE Annual Meeting, Las Vegas, Nevada, May 15-19, 2016.
3. ⁺Placette, M. and Schwartz, C.J.: "Comparison of fundamental friction mechanisms of Greenwood-Williamson versus fractal surface types using computational methods," presentation, 2015 STLE Annual Meeting, Dallas, Texas, May 17-21, 2015.
4. ⁺Darden, M.A. and Schwartz, C.J.: "Skin tribology phenomena associated with reading braille print: the influence of cell patterns and skin behavior on coefficient of friction," presentation, 2015 STLE Annual Meeting, Dallas, Texas, May 17-21, 2015.
5. ⁺Wilde, T. and Schwartz, C.J.: "Parametric investigation of the mechanics of soft-body contact with parallel-ridge textured surfaces to understand tactile friction," presentation, 2015 STLE Annual Meeting, Dallas, Texas, May 17-21, 2015.
6. ⁺Darden, M.A. and Schwartz, C.J.: "Skin tribology phenomena associated with reading braille print: the influence of cell patterns and skin behavior on coefficient of friction," paper and presentation, 20th International Conference on Wear of Materials (WOM), Toronto, Ontario, Canada, April 12-16, 2015.
7. ⁺Darden, M. and Schwartz, C.J.: "Skin tribology phenomena associated with reading braille print: the influence of cell patterns and media type," 2014 International Conference on BioTribology, Toronto, Ontario, Canada, May 11-14, 2014.
8. ⁺Chimata, G. and Schwartz, C.J.: "Determination of tactile discrimination thresholds for randomly textured surfaces and their relationship to frictional variation," 2014 International Conference on BioTribology, Toronto, Ontario, Canada, May 11-14, 2014.
9. ⁺Laux, K. and Schwartz, C.J.: "*Wear of PEEK and its dependence on wear path shape and direction,*" 2013 STLE Annual Meeting, Detroit, Michigan, May 5-9, 2013.
10. ⁺Laux, K.A. and Schwartz, C.J.: "*Influence of Linear Reciprocating and Multi-Directional Sliding on PEEK Wear Performance and Transfer Film Formation,*" paper and presentation, 19th International Conference on Wear of Materials (WOM), Portland, Oregon, April 13-18, 2013
11. ⁺Plumlee, K. and Schwartz, C.J.: "*Investigation of surface layer plastic deformation in UHMWPE wear, and its relationship to the classic rippled surface phenomenon,*" paper and presentation, 19th International Conference on Wear of Materials (WOM), Portland, Oregon, April 13-18, 2013
12. Schwartz, C.J. and ⁺Darden, M.: "*Investigating the haptics of textured polypropylene using friction coefficient,*" paper and presentation, 2013 Society of Plastics Engineers International Polyolefins Conference, Houston, Texas, February 24-26, 2013

13. ⁺Chimata, G. and Schwartz, C.J.: *"Using a synthetic skin platform to further investigate the results of a classic dermal blistering study,"* 2012 ASME/STLE International Joint Tribology Conference, Denver, Colorado, October 8, 2012.
14. ⁺Plumlee, K. and Schwartz, C.J.: *"Understanding wear mechanisms by analyzing wear debris from various grades of polyethylene,"* 2012 ASME/STLE International Joint Tribology Conference, Denver, Colorado, October 8, 2012.
15. ⁺Darden, M. and Schwartz, C.J.: *"The role of macro-scale surface geometry in the coefficient of friction of fingertips and elastomers against textured surfaces,"* 2012 STLE Annual Meeting, St. Louis, Missouri, May 6-10, 2012.
16. ⁺Laux, K. and Schwartz, C.J.: *"Influence of uni- and multi-directional sliding on PEEK wear performance and transfer film formation,"* 2012 STLE Annual Meeting, St. Louis, Missouri, May 6-10, 2012.
17. ⁺Plumlee, K. and Schwartz, C.J.: *"Debris size investigation of polyethylene wear,"* 2012 STLE Annual Meeting, St. Louis, Missouri, May 6-10, 2012.
18. ⁺Darden, M. and Schwartz, C.J.: *"Investigation of friction models to describe fingertip sliding across textured surfaces,"* abstract and presentation, 2011 ASME/STLE International Joint Tribology Conference, Los Angeles, California, October 24-26, 2011.
19. ⁺Camou, A. and Schwartz, C.J.: *"Harvesting of frictional heat in polymer bearings using a thermoelectric approach,"* abstract and presentation, 2011 ASME/STLE International Joint Tribology Conference, Los Angeles, California, October 24-26, 2011.
20. ⁺Laux, K. and Schwartz, C.J.: *"Investigation of the dependence of PEEK wear on transfer film mechanics,"* abstract and presentation, 2011 ASME/STLE International Joint Tribology Conference, Los Angeles, California, October 24-26, 2011.
21. ⁺Darden, M. and Schwartz, C.J.: *"Understanding the Relationship between Texture and Friction for Tactile Surfaces,"* abstract and presentation, International Conference on BioTribology, London, UK, September 18-21, 2011.
22. ⁺Guerra, C.A. and Schwartz, C.J.: *"Using a Synthetic Skin Construct to Investigate Dermal Blistering Mechanics and Injury Potential of Foreign Surfaces,"* abstract and presentation, International Conference on BioTribology, London, UK, September 18-21, 2011.
23. ⁺Plumlee, K.G. and Schwartz, C.J.: *"Experimental and Numerical Approach to Investigate the Origins of UHMWPE Debris Size and Shape,"* abstract and presentation, International Conference on BioTribology, London, UK, September 18-21, 2011.
24. Froyd, J., Rajagopal, K., and Schwartz, C.J., *"Comprehensive Course Redesign: Introduction to the Mechanics of Materials,"* 118th ASEE Annual Conference & Exposition, Vancouver, British Columbia, June 25-29, 2011.
25. ⁺Guerra, C. and Schwartz, C.J. *Using a Synthetic Skin to Investigate Dermal Blister Formation,"* 2011 Society of Tribologists and Lubrication Engineers Annual Meeting, Atlanta, Georgia, May 15-19, 2011
26. ⁺Plumlee, K. and Schwartz, C.J. *"Applying Debris Characterization Metrics to Investigate UHMWPE Wear Mechanisms,"* Society of Tribologists and Lubrication Engineers Annual Meeting, Atlanta, Georgia, May 15-19, 2011
27. ⁺Camou, A. and Schwartz, C.J., *"Investigating the Potential of Using Thermoelectric Devices to Harvest Frictional Heat Produced in Polymer*

- Bearings*,” Materials Research Society Spring Meeting and Exhibit, San Francisco, California, April 25-29, 2011
28. ⁺Plumlee, K. and Schwartz, C.J., “*Investigating UHMWPE Wear Mechanisms by Decomposing Wear Debris Distributions*,” 18th International Conference on Wear of Materials (WOM), Philadelphia, Pennsylvania, April 3-7, 2011
 29. Schwartz, C.J. and ⁺Darden, M., “*The Role of Friction in Controlling Haptic Characteristics of Textured Polymer Surfaces*,” Society of Plastics Engineers International Polyolefins Conference, Houston, Texas, February 27-March 2, 2010
 30. ⁺Guerra, C. and Schwartz, C.J., “*A Multi-Layered Construct to Simulate Frictional Damage to Skin*,” ASME/STLE International Joint Tribology Conference, San Francisco, California, October 18-20, 2010
 31. ⁺Darden, M. and Schwartz, C.J., “*Fractal Analysis as a Tool for Tactile Optimization*,” ASME/STLE International Joint Tribology Conference, San Francisco, California, October 18-20, 2010
 32. ⁺Plumlee, K.G. and Schwartz, C.J., “*Establishing the Connection between Debris Size and Properties of Orthopaedic UHMWPE*,” ASME/STLE International Joint Tribology Conference, San Francisco, California, October 18-20, 2010
 33. ⁺Darden, M. and Schwartz, C.J., “*Surface Characterization Metrics for Use in Modeling Polymer Tactility*,” 65th STLE Annual Meeting, Las Vegas, Nevada, May 16-20, 2010
 34. ⁺Darden, M. and Schwartz, C.J., “*Enhancing Polyolefin Value through Haptics*,” SPE International Polyolefins Conference, Houston, Texas, February 21-24, 2010
 35. ⁺Plumlee, K.G. and Schwartz, C.J., “*UHMWPE Composites for Orthopaedic Applications: A New Paradigm*,” ASME/STLE International Joint Tribology Conference, Memphis, Tennessee, October 19-21, 2009
 36. Schwartz, C.J. and ⁺Plumlee, K.G., “*Porous UHMWPE Scaffolds Impregnated with Bio-derived Materials: A New Class of Orthopedic Material*,” STLE 64th Annual Meeting, Lake Buena Vista, Florida, May 17-21, 2009
 37. ⁺Darden, M. and Schwartz, C.J., “*Investigation of Skin Tribology and its Effects on the Tactile Attributes of Polymer Fabrics*,” Seventeenth International Conference on Wear of Materials, Las Vegas, Nevada, April 21, 2009
 38. ⁺Plumlee, K. and Schwartz, C.J., “*Improved Wear Resistance of Orthopaedic UHMWPE by Reinforcement with Zirconium Particles*,” Seventeenth International Conference on Wear of Materials, Las Vegas, Nevada, April 21, 2009
 39. ⁺Plumlee, K. and Schwartz, C.J., “*Orthopaedic Potential for Polymer-Proteoglycan Composites through Development of Porous UHMWPE Morphologies*,” 45th Annual Technical Meeting of the Society of Engineering Science: Orthopaedic Bioengineering – Nano to Device Level, October 12-15, 2008
 40. Schwartz, C.J., Bahadur, S., Mallapragada, S., “*Effect of crosslinking and Pt-Zr quasicrystal fillers on the mechanical properties and wear resistance of UHMWPE for use in artificial joints*,” Sixteenth International Conference on Wear of Materials, Montreal, Quebec, April 19, 2007
 41. Schwartz, C.J. and Bahadur, S. “*Development of a Novel Wear Testing Device for the Investigation of Articular Cartilage and Compliant Materials for Use in*

- Biomedical Implants*,” ASME World Tribology Congress III, Washington, D.C., September 14, 2005
42. Schwartz, C.J. and Bahadur, S. “*The Role of Filler Deformability, Filler-Polymer Bonding, and Counterface Material on the Tribological Behavior of Polyphenylene Sulfide (PPS)*.” Thirteenth International Conference on Wear of Materials, Vancouver, British Columbia, April 25, 2001
 43. Schwartz, C.J. and Sills, J.A., “*Increasing the Accuracy of Guided Wave Inspection Data Using Matched Filtering Techniques*.” Twenty-seventh Annual Review of Progress in Quantitative Nondestructive Evaluation, Ames, Iowa, July 20, 2000
 44. Light, G.M., Schwartz, C.J., Spinks, R.L., “*Heat Exchanger Tube Inspection Using Magnetostrictive Sensor (MsS) Technology*.” Electric Power Research Institute (EPRI) Balance-of-Plant Heat Exchanger Nondestructive Evaluation Symposium, Scottsdale, Arizona, June 20, 2000
 45. Schwartz, C.J. and Light, G.M., “*Use of Magnetostrictive Sensor Technology for Detection of Transverse Defects in Rail*,” American Society for Nondestructive Testing Spring Conference, Birmingham, Alabama, March 29, 2000

INVITED PRESENTATIONS AND WORKSHOPS

- *Mentoring Engineering Students to Consider Accessibility in Design*, presented at the AccessEngineering Capacity Building Institute, Seattle, Washington, April 6-8, 2016.
- *Proposing Research that Involves Students with Disabilities*, presented at the Engaging Persons with Disabilities in Research symposium, Iowa State University, October 27, 2015
- *Investigating the Role of Skin Tribology in the Development of Haptic Outcomes*, presented to faculty and staff at INM – Leibniz Institute for New Materials, Saarbrücken, Germany, September 16, 2011.
- *Design and Optimization of Total-Joint Replacements*, Orthopaedic Surgery Residency Program, Bone and Joint Institute, Scott & White Hospital, Temple, Texas, May 22, 2008
- *Scratch and Wear Behavior of Polymers and Composites*, Industry Short Course, Friedrich, K., Schwartz, C.J, Sue, H.J., April 22-23, 2008
- Biomedical Engineering Workshop Instructor, BEGR 4211 & 4311, LeTourneau University, Longview, Texas, November 16-17, 2007
- *Band Aids, Basketballs and Haptics: An introduction to skin-material interactions and how they can add product value*, C.J. Schwartz, presented to staff at Dow Chemical Company, Freeport, Texas, March 22, 2007
- *Demonstration of Anti-Traction Material and Mobility Denial System Dispenser Hardware Concepts*. R.M. Mathis, L.N. Houy, E.M. Brigance, C.J. Schwartz, M.C. Marshall, N.K. Reinhardt, R. Glauser, to United States Army and Marine Corps Staff and Potential Contracting Firms, San Antonio, Texas, July 18, 2003

- *Potential Techniques for Location Determination of Corn Chips on a Manufacturing Conveyor System.* C.J. Schwartz, G.M. Light, R.H. Hill, presented to staff of Frito-Lay, Inc., Plano, Texas, September 2000
- *Using Axial Vibrational Resonance Techniques to Estimate Paraffin Thickness on Deep Sea Oil Pipeline Risers.* C.J. Schwartz, G.M. Light, presented to DeepStar, a joint-industry consortium for the development of deep water petroleum assets, Houston, Texas, December 6, 1999

PATENTS

Apparatus and Method for Analysis of Guided Ultrasonic Waves, Sills, J.A., Schwartz, C.J., U.S. Patent No. 6,581,014

Easily Dispensed, Anti-Traction, Mobility Denial System, Mallow, W.A., Mathis, R.J., Warren, A.B., Schwartz, C.J., Brigance, E.M., Collins, K.R., Reinhardt, N.K., Marshall, M.C., U.S. Patent No. 7,067,464

Easily Dispensed, Anti-Traction, Mobility Denial System, Mallow, W.A., Mathis, R.J., Warren, A.B., Schwartz, C.J., Brigance, E.M., Collins, K.R., Reinhardt, N.K., Marshall, M.C., U.S. Patent No. 7,419,942

FUNDED PROJECTS

- Developing a Line Characterization Diagnostic Tool, Sandia National Laboratories, PI-Christian Schwartz, Co-PI: Zixiang Xiong (TAMU), 10/1/06-9/30/07, \$70,000 (\$52,390 Schwartz).
- The Lone Star Challenge, Air Force Research Laboratories, PI-C. Schwartz, 10/1/07-5/31/08, \$58,797.
- Investigation of Network Analysis for Remote Line Diagnostics, Sandia National Laboratories, PI-C. Schwartz, Co-PI: Zixiang Xiong (TAMU), 10/1/07-9/30/08, \$104,994 (\$87,253 Schwartz).
- Development of an Embedded Monitoring Device, Sandia National Laboratories, PI – C. Schwartz, Co-PI: Z. Xiong (TAMU), 10/1/08-9/30/09, \$41,875 (\$32,583 Schwartz).
- Development of Configurable Enablement Sequencer, Sandia National Laboratories, PI – C. Schwartz, Co-PI: Z. Xiong (TAMU), 10/1/08-9/30/09, \$41,875 (\$32,583 Schwartz).
- Comprehensive Course Redesign: Introduction to Mechanics of Materials, NSF Course, Curriculum, and Laboratory Improvement (CCLI), PI – K. Rajagopal (TAMU), Co-PI's – C. Schwartz, J. Froyd (TAMU), 9/1/09 - 8/31/2011, \$150,000 (\$73,722 Schwartz).
- Investigation of Technology to Disseminate Humanitarian Information to Displaced Populations, Sandia National Laboratories, PI – C. Schwartz, Co-PI: R. Malak (TAMU), Z. Xiong (TAMU), 9/8/09-9/7/10, \$100,000 (\$74,025 Schwartz).
- Investigation of Urban Surveillance Technologies, Air Force Research Laboratory, PI – C. Schwartz, Co-PI: R. Malak (TAMU), 11/4/09-6/30/10, \$45,350 (\$22,675 Schwartz).
- Empowering the Visually Impaired by Understanding Links between Tactility and Properties of Surfaces, NSF CBET, PI – C. Schwartz, 1/1/11-12/31/13, \$250,983.
- Investigation of Display and Deployment Technologies for Humanitarian Information Dissemination, Sandia National Laboratories, PI – C. Schwartz, Co-PI: B. Rasmussen (TAMU), 9/1/10-6/30/11, \$74,996 (\$70,597 Schwartz).
- Consortium for Advancing Performance Polymers in Energy Applications (APPEAL), industry consortium, PI – H.J. Sue (TAMU), C. Schwartz, J. Bluemel (TAMU), 10/1/10-8/31/2011, \$150,000 (\$50,000 Schwartz).
- Investigation of the Tribological Behavior of High Performance Thermoplastics, Hoerbiger Corporation of America, PI – C. Schwartz, 9/1/11-8/31/13, \$280,000.
- Development of Innovative Tactile Communication Technologies, Sandia National Laboratories, PI – C. Schwartz, 10/1/11-9/30/12, \$83,813.
- CAREER: Using Haptically Augmented Tactile Communication Methods to Foster the Inclusion of the Visually Impaired in STEM Professions, NSF CBET, PI – C. Schwartz, 6/1/12-5/31/17, \$400,000.

TECHNICAL and PROFESSIONAL SOCIETIES

Active membership

- American Society of Mechanical Engineers (ASME)
- Society of Tribologists and Lubrication Engineers (STLE)
- Tau Beta Pi, Engineering Honors Society
- Pi Tau Sigma, Mechanical Engineering Honors Society

Past membership

- Orthopaedic Research Society (ORS)
- Society of Plastics Engineers (SPE)
- American Society for Engineering Education (ASEE)

SERVICE ACTIVITIES

Editorial Duties

- Editorial Board, *Wear*, April 2015 – present.
- Editorial Board, *Biotribology*, June 2014 – present.
- Associate Editor, *Tribology Transactions*, 2012 – 2015

Offices Held

- Conference Chair, 21st International Conference on Wear of Materials (WOM) 2017, elected, April 2015 – present.
- President of Wear of Materials, Inc. Board of Directors, April 2013 – present.
- Vice President of Wear of Materials, Inc. Board of Directors, April 2013 – present.
- Program Chair, 20th International Conference on Wear of Materials (WOM) 2015, elected, April 2013 – April 2015.
- Session Organizer, International Polyolefins Conference 2013, 2012 – present
- Paper Solicitation Chair, STLE 2013 Annual Meeting, appointed, 2012 – present
- Editorial Committee, 19th International Conference on Wear of Materials (WOM), 2/2011 – present
- Steering Committee, 19th International Conference on WOM, 4/2011 – present
- Organising Committee, London Biotribology Conference, 4/2010 – present
- Steering Committee, 18th International Conference on WOM, 4/2009 – present
- Poster Chair, 18th International Conference on WOM, 4/2009 – present
- TAMU Mechanical Engineering Department ABET Committee, 2007 – present
- TAMU MEEN Educational Development Committee, 2008 – present
- Faculty Advisor, Society of Plastics Engineers, TAMU section, 2008 – present
- Proposal Review Panelist, NSF, 12/2007, 11/2008, 10/2010
- Invited Lecturer on Design and Project Management, BrazosBEST, 2007, 2008
- Review Coordinator, ASME International Conference on Design Theory and Methodology (DTM), 2007, 2008
- ATMENTOR, Texas A&M University, 2006-present

Community Service and Outreach

- Special Programs Course Instructor, Texas School for the Blind and Visually Impaired, 2010 - 2016
- Human Relations Commission, City of Ames, Iowa, 2005-2006
- Adult Literacy Tutor, Story County, Iowa, 1998