

# ERIK T. THOSTENSON

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## EXECUTIVE SUMMARY

Dr. Thostenson is faculty in the Department of Mechanical Engineering at the University of Delaware. Professor Thostenson's research focuses on processing and characterization of composite materials based on carbon nanotubes, graphene, and advanced fiber reinforcements toward the development of novel multifunctional composites and micro/nano mechanics modeling techniques. During the course of the research he has developed novel processing and characterization techniques for the development of structure/property relationships and *in situ* sensors in nanotube-reinforced polymer and ceramic composites. His research has been cited more than 5,200 times in the scientific literature (ISI Database: 5,231 Citations, H-index of 21; Google Scholar: 8,190 Citations, H-index of 25 – 4/15/2014).

Thostenson received a National Science Foundation Early Career Development Award (CAREER) and a Young Investigator Proposal (YIP) Award from the Air Force Office of Scientific Research. He has been PI or Co-PI on several major research programs funded by the National Science Foundation, Air Force Office of Scientific Research, Army Research Office, and Office of Naval Research. He has also been PI or Co-PI of small business technology transfer research (STTR) programs funded by the Office of Naval Research and the Air Force Office of Scientific Research and US Army Corps of Engineers.

In 2014 Thostenson received the Outstanding McNair Faculty Mentor Award from the McNair Scholars Program at the University of Delaware. He is the recipient of the Elsevier Young Composites Researcher Award from the American Society for Composites which is awarded to a researcher early in his/her career has made a significant impact on the science and technology of composite materials through a sustained research effort. In 2013 he was awarded the Distinguished Young Alumnus Award from Winona State University recognizing his contributions to the field of composite materials and his commitment to the University. Thostenson is also the recipient of the inaugural Hayashi International Memorial Award (2004) from the Japan Society for Composite Materials, recognizing outstanding young international researchers in the field of composites. He received the Allan P. Colburn Prize for outstanding dissertation in the engineering and mathematical sciences (University of Delaware Office of Graduate Studies), the Roy L. McCullough Scholars Award (Center for Composite Materials) for exceptional contributions to the literature on composite materials, and the Society for the Advancement of Material and Process Engineering (SAMPE) Outstanding Graduate Student Award.

Thostenson, who holds a Ph.D. in Materials Science and a master's degree in Mechanical Engineering from the University of Delaware, is an affiliated faculty member at the University of Delaware's Center for Composite Materials. In addition to his scholarly research in advanced materials at the graduate and post-graduate level, Dr. Thostenson has a Bachelor's degree in Composite Materials Engineering (Summa Cum Laude) from Winona State University (Minnesota).

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## EDUCATION

- Doctor of Philosophy** in Materials Science (2004)  
University of Delaware, Newark, Delaware  
**Dissertation:** Carbon Nanotube-Reinforced Composites: Processing, Characterization and Modeling
- Master of Science** in Mechanical Engineering (1999)  
University of Delaware, Newark, Delaware  
**Thesis:** Microwave-Accelerated Curing of Thick Composite Laminates: Experiment and Simulation
- Bachelor of Engineering** in Composite Materials Engineering (1995)  
Winona State University, Winona, Minnesota  
**Summa Cum Laude**

## PROFESSIONAL EXPERIENCE

- Assistant Professor** (2009 - Present)  
Department of Mechanical Engineering – University of Delaware  
Affiliated Faculty, Department of Materials Science and Engineering
- Research Assistant Professor** (2006 - 2009)  
Department of Mechanical Engineering – University of Delaware
- Associate Scientist** (2005 - 2006)  
Department of Mechanical Engineering – University of Delaware
- Postdoctoral Research Fellow** (2004 - 2005)  
Department of Mechanical Engineering and Center for Composite Materials – University of Delaware
- Research Assistant** (1995 - 2003)  
Department of Mechanical Engineering, Department of Materials Science & Engineering and Center for Composite Materials – University of Delaware
- Graduate Lecturer** (Fall 2000)  
Department of Materials Science and Engineering – University of Delaware
- Laboratory Assistant**, Fermi National Accelerator Laboratory (Summer 1995, 1993)
- Teaching Assistant**, Department of Composite Materials Engineering (1994-95)  
– Winona State University

## HONORS AND AWARDS

1. **Outstanding McNair Faculty Mentor Award**, McNair Scholars Program, University of Delaware – 2014
2. **Faculty Early Career Development Award (CAREER)**, National Science Foundation – 2013-2017

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3. **Distinguished Young Alumnus Award**, Winona State University – 2013
4. **Young Investigator Award**, Air Force Office of Scientific Research – 2009-2012
5. **Elsevier Young Composites Researcher Award**, American Society for Composites – 2007
6. **Hayashi International Memorial Award**, Japan Society for Composite Materials – 2004
7. **Allan P. Colburn Prize for Outstanding Dissertation in the Mathematical and Engineering Sciences**, University of Delaware – 2004
8. **Roy L. McCullough Scholar's Award**, Center for Composite Materials – 2004
9. **Outstanding Graduate Student Award**, Society for the Advancement of Material and Process Engineering (SAMPE) – 1<sup>st</sup> place, Ph.D. Student Symposium – 2002
10. **University of Delaware Competitive Fellowship** – 2000-2001
11. **Directors' Award**, Center for Composite Materials – 1999
12. **Hoechst Celanese Excellence in Engineering Award** – 1998
13. **C. E. Birchenall Award**, Brandywine Valley Chapter of ASM International – 1997
14. **ARO/URI Fellowship** – 1995-1998
15. **Finalist, Sport Science & Technology Design Contest**, U.S. Olympic Committee – 1995
16. **Society of Plastics Engineers Scholarship** – 1994
17. **Non-resident Tuition Scholarship**, Winona State University – 1991-1995
18. **Winona State University Dean's List** – 1992-1995 (11 of 12 quarters)

## UNITED STATES PATENTS

1. E. T. Thostenson and T-W. Chou, ***Method and system for detecting damage in aligned carbon nanotube fiber composites using networks*** (US Patent #: 11/906366), Patent Award Date: 08/31/2010, Patent Filing Date: 10/02/2007.
2. D. Heider, G. Pandey, A. Abu-Obaid, E. T. Thostenson and J. W. Gillespie, Jr. ***System and Methods for use in Monitoring a Structure***, Serial Number 13/887,592 Patent Filing Date: 05/06/2013.
3. E. T. Thostenson ***Process and Utility of Nanostructured Fabrics***, Serial Number 61/932,465. Provisional Patent Filing Date: 01/28/2014.
4. T. Schumacher and E. T. Thostenson ***Integrated Strengthening and Monitoring of Structures using Structural Carbon Nanotube-Based Composites***, Serial Number 61/941,686. Provisional Patent Filing Date: 02/19/2014.

## BOOK CHAPTERS

1. S. N. Doshi and E. T. Thostenson, "Self-Sensing Carbon Nanotube Composites: Processing and Characterization," *to appear in Plastics Design Library Handbooks – Multi-Functionality of Polymer Composites*, Elsevier, Eds: K. Friedrich and U. Brewer (2014).

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2. C. Y. Li, E. T. Thostenson and T-W. Chou, "Carbon Nanotube-Based Composites and Damage Sensing," **Multifunctional Polymer Nanocomposites**, CRC Press, Eds: J. Leng, A Kin-Tak Lau (2010).
3. D. Heider, R. C. Don, E. T. Thostenson, K Tackitt, J. H. Belk and T. Munns, "Cure Monitoring and Control," **ASM Handbook Volume 21 Composites**, ASM International, Materials Park, OH (2001).

## PUBLICATIONS – REFEREED LITERATURE

### Citation Statistics (4/15/2014)

ISI Database: 5,231 Citations, H-index: 21, i10-index: 33

Google Scholar: 8,190 Citations, H-index: 25, i10-index: 35

### Publications as Tenure-Track Assistant Professor

1. Q. An, A. N. Rider and E. T. Thostenson, "Model carbon nanotube/glass-fiber/epoxy composite interphases: Surface analysis and fracture behavior," *Submitted* (2014).
2. T. Schumacher and E. T. Thostenson, "Development of structural carbon nanotube-based sensing composites for concrete structures," **Journal of Intelligent Material Systems and Structures**, published online DOI: 10.1177/1045389X13505252 (2013).
3. G. Pandey, E. T. Thostenson and D. Heider, "Electric time domain reflectometry sensors for non-invasive structural health monitoring of glass fiber composites," **Progress in Electromagnetics Research**, 137: 551-564 (2013).
4. Q. An, A. N. Rider and E. T. Thostenson, "Hierarchical Composite Structures Prepared by Electrophoretic Deposition of Carbon Nanotubes onto Glass Fibers," **ACS Applied Materials and Interfaces**, 4(7): 3508-3516 (2013).
5. G. Pandey H. Deffor, E. T. Thostenson and D. Heider, "Smart tooling with integrated time domain reflectometry sensing line for non-invasive flow and cure monitoring during composites manufacturing," **Composites Part A**, 47(1): 102-108 (2013).
6. K. L. Lasater and E. T. Thostenson, "in Situ Thermoresistive Characterization of Multifunctional Composites of Carbon Nanotubes," **Polymer**, 53(23): 5367-5374 (2012).
7. G. Pandey and E. T. Thostenson "Carbon Nanotube-Based Multifunctional Polymer Nanocomposites," **Polymer Reviews**, 52(3-4): 355-416 (2012).
8. Q. An, A. N. Rider, and E. T. Thostenson "Electrophoretic deposition of carbon nanotubes onto carbon-fiber fabric for production of carbon/epoxy composites with improved mechanical properties," **Carbon**, 50(11): 4130-4143 (2012).
9. A. S. Wu, A. M. Coppola, M. J. Sinnott, T-W. Chou, E. T. Thostenson, J. H. Byun. and B. S. Kim, "Sensing of damage and healing in three-dimensional braided composites with vascular channels," **Composites Science and Technology**, 72(13): 1618-1626 (2012).

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10. G. Pandey, M. Wolters, E. T. Thostenson and D. Heider "Localized functionally modified glass fibers with carbon nanotube networks for crack sensing in composites using time domain reflectometry," **Carbon**, 50(10): 3816-3825 (2012).
11. S. M. Friedrich, A. S. Wu, E. T. Thostenson and T-W. Chou, "Damage mode characterization of mechanically fastened composite joints using carbon nanotube networks," **Composites Part A**, 42(12): 2003-2009 (2011).
12. L. M. Gao, T-W. Chou, E. T. Thostenson and Z. G. Zhang, "In situ sensing of impact damage in epoxy/glass fiber composites using percolating carbon nanotube networks," **Carbon**, 49(10): 3382-3385 (2011).
13. A. S. Lim, Z. R. Melrose, E. T. Thostenson and T-W. Chou, "Damage sensing of adhesively-bonded hybrid composite/steel joints using carbon nanotubes," **Composites Science and Technology**, 71(9): 1183-1189 (2011).
14. A. S. Lim, Q. An, T-W. Chou and E. T. Thostenson, "Mechanical and electrical response of carbon nanotube-based fabric composites to Hopkinson bar loading," **Composites Science and Technology**, 71(5): 616-621 (2011).
15. S-B. Lee, O. Choi, W. Lee, J-W. Yi, B-S. Kim, J-H. Byun, M-K. Yoon, H. Fong, E. T. Thostenson and T-W. Chou, "Processing and characterization of multi-scale hybrid composites reinforced with nanoscale carbon reinforcements and carbon fibers," **Composites Part A**, 42(4): 337-344 (2011).
16. W. Lee, S-B Lee, O. Choi, J-W Yi, M-K Um, J-H. Byun, E. T. Thostenson and T-W. Chou, "Formicary-like carbon nanotube/copper hybrid nanostructures for carbon fiber-reinforced composites by electrophoretic deposition," **Journal of Materials Science**, 46(7): 2359-2364 (2011).
17. A. Gawandi, E. T. Thostenson and J. W. Gillespie, "Tow pullout behavior of polymer-coated Kevlar fabric," **Journal of Materials Science**, 46(1): 77-89 (2011).
18. K. J. Kim, W. R. Yu, J. S. Lee, L. M. Gao, E. T. Thostenson, T-W. Chou and J. H. Byun, "Damage characterization of 3D braided composites using carbon nanotube-based in situ sensing," **Composites Part A**, 41(10): 1531-1537 (2010).
19. L. M. Gao, E. T. Thostenson, Z. G. Zhang, J-H. Byun and T-W. Chou, "Damage Monitoring in Fiber-Reinforced Composites under Fatigue Loading Using Carbon Nanotube Networks," **Philosophical Magazine**, 90(31-32): 4085-4099 (2010).
20. L. M. Gao, T-W. Chou, E. T. Thostenson and Z. G. Zhang, "A comparative study of damage sensing in fiber composites using uniformly and non-uniformly dispersed carbon nanotubes," **Carbon**, 48(13): 3788-3794 (2010).
21. W. B. Lu, T-W. Chou and E. T. Thostenson, "A three-dimensional model of electrical percolation thresholds in carbon nanotube-based composites," **Applied Physics Letters**, 96(22): 223106 (2010).

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22. L. M. Gao, T-W. Chou, E. T. Thostenson, A. Godara, Z. G. Zhang and L Mezzo, "Highly conductive polymer composites based on controlled agglomeration of carbon nanotubes," **Carbon**, 48(9): 2649-2651 (2010).
23. T-W Chou, L. M. Gao; E. T Thostenson; Z. G. Zhang and J-H. Byun, "An Assessment of the Science and Technology of Carbon Nanotubes and their Composites," **Composites Science and Technology**, 70(1): 1-19 (2010).

### **Publications as Research Assistant Professor**

24. E. T. Thostenson, J. J. Gangloff Jr., C. Y. Li and J-H. Byun "Electrical Anisotropy in Multi-Scale Nanotube/Fiber Composites," **Applied Physics Letters**, 97(5): 073111 (2009).
25. E. T. Thostenson S. Ziaee and T-W. Chou, "Processing and Electrical Properties of Carbon Nanotube / Vinyl Ester Nanocomposites," **Composites Science and Technology**, 69(6): 801-804 (2009).
26. L. M. Gao, E. T. Thostenson Z. G. Zhang and T-W. Chou, "Coupled Carbon Nanotube Network and Acoustic Emission Monitoring for Sensing of Damage Development in Composites," **Carbon**, 47(5): 1381-1388 (2009).
27. K. Okubo, T. Fuji and E. T. Thostenson, "Multi-Scale Hybrid Biocomposite: Processing and Mechanical Characterization of Bamboo Fiber Reinforced PLA with Microfibrillated Cellulose," **Composites - Part A**, 40(4): 469-475 (2009).
28. L. M. Gao, E. T. Thostenson, Z. G. Zhang and T-W. Chou, "Sensing of Damage Mechanisms in Fiber-Reinforced Composites under Cyclic Loading using Carbon Nanotubes," **Advanced Functional Materials**, 19(1): 123-130 (2009).
29. E. T. Thostenson and T-W. Chou, "Carbon Nanotube-Based Health Monitoring of Mechanically Fastened Composite Joints," **Composites Science and Technology**, 68(12) 2557–2561 (2008).
30. E. T. Thostenson and T-W. Chou, "Real-Time in situ Sensing of Damage Evolution in Advanced Fiber Composites using Carbon Nanotube Networks," **Nanotechnology**, 19(21) 215713 (2008).
31. C. Y. Li, E. T. Thostenson and T-W. Chou, "Sensors and Actuators Based on Carbon Nanotubes and their Composites: A Review," **Composites Science and Technology**, 68(6) 1227-1249 (2008).
32. C. Y. Li, E. T. Thostenson and T-W. Chou, "Effect of Nanotube Waviness on the Electrical Conductivity of Carbon Nanotube-Based Composites," **Composites Science and Technology**, 68(6) 1445-1452 (2008).
33. E. Bekyarova, E. T. Thostenson, A. Yu, M.E. Itkis, D. Fakhrutdinov, T-W. Chou and R.C. Haddon, "Functionalized Single-Walled Carbon Nanotubes for Carbon Fiber-Epoxy Composites," **Journal of Physical Chemistry C**, 111(48) 17865 - 17871 (2007).

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34. C. Li, E. T. Thostenson and T-W. Chou, "Dominant role of tunneling resistance in the electrical conductivity of carbon nanotube-based composites," *Applied Physics Letters*, 91(22), 223114 (2007).
35. E. Bekyarova, E. T. Thostenson, A. Yu, H. Kim, J. Gao, J. Tang, H. T. Hahn, T-W. Chou, M. E. Itkis and R. C. Haddon, "Multiscale Carbon Nanotube – Carbon Fiber Reinforcement for Advanced Epoxy Composites," *Langmuir*, 23(7), 3970-3974 (2007).
36. E. T. Thostenson and T-W. Chou, "Carbon Nanotube Networks: Sensing of Distributed Strain and Damage for Life Prediction and Self-Healing" *Advanced Materials*, 18(22) 2837-2841 (2006).
37. E. T. Thostenson and T-W. Chou, "Processing-Structure-Multifunctional Property Relationship in Carbon Nanotube/Epoxy Composites," *Carbon*, 44(14) 2869-3148 (2006).

### **Publications as Associate Scientist, Postdoctoral Researcher and Graduate Student**

38. E. T. Thostenson, P. G. Karandikar and T-W. Chou, "Fabrication and Characterization of Reaction Bonded Silicon Carbide / Carbon Nanotube Composites," *Journal of Physics D: Applied Physics*, 38(21) 3962-3965 (2005).
39. E. T. Thostenson, C. Y. Li and T-W. Chou, "Nanocomposites in Context," *Composites Science and Technology*, 65(3-4) 491-516 (2005).
40. E. T. Thostenson and T-W. Chou, "Nanotube Buckling in Aligned Multi-Wall Carbon Nanotube-Reinforced Composites," *Carbon*, 45 3015-3018 (2004).
41. E. T. Thostenson and T-W. Chou, "On the Elastic Properties of Carbon Nanotube-Based Composites: Modeling and Characterization," *Journal of Physics D: Applied Physics*, 36(5) 573-582 (2003).
42. E. T. Thostenson and T-W. Chou, "Aligned Multi-Walled Carbon Nanotube-Reinforced Composites: Processing and Mechanical Characterization," *Journal of Physics D: Applied Physics*, 35(16) L77-L80 (2002).
43. E. T. Thostenson, W. Z. Li, D. Z. Wang, Z. F. Ren and T-W. Chou, "Carbon Nanotube/Carbon Fiber Hybrid Multiscale Composites," *Journal of Applied Physics*, 91(9) 6034-6037 (2002).
44. E. T. Thostenson, Z. F. Ren and T-W. Chou, "Advances in the Science and Technology of Carbon Nanotubes and their Composites: A Review," *Composites Science and Technology*, 61(13) 1899-1912 (2001).
45. E. T. Thostenson and T-W. Chou, "Microwave and Conventional Curing of Thick-Section Thermoset Composite Laminates: Experiment and Simulation," *Polymer Composites*, 22(2), 197-212 (2001).
46. E. T. Thostenson and T-W. Chou, "Microwave Processing: Fundamentals and Applications," *Composites Part A*, 30(9), 1055-1071, (1999).

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47. J. Li, E. T. Thostenson, T-W. Chou and L. Riester, "An Investigation of Thin-Film Coating/Substrate Systems by Nanoindentation," *Journal of Engineering Materials and Technology*, 120(2), 154-162, (1998).
48. R. W. Rydin, E. T. Thostenson and H-Y. Ma, "An Assessment of the Impact Response of Knit-Knit and Knit-Stitch Composites," *Science and Engineering of Composite Materials*, 7(3), 269-277 (1998).

### CONFERENCE PUBLICATIONS

#### Publications as Tenure-Track Assistant Professor

1. E. T. Thostenson, Q. An and A. N. Rider, Scalable Processing of Multifunctional Nanotube/Fiber Hybrid Composites," to appear in the **16<sup>th</sup> European Conference on Composite Materials (ECCM16)**, Seville, Spain, June 22-26 (2014).
2. J. McConnell, T. Schumacher, E. T. Thostenson, T. Wennick and P. Keller, "Evaluating Structural Steel for Reuse through Field Monitoring," to appear in the **37<sup>th</sup> International Association for Bridge and Structural Engineering (37<sup>th</sup> IBASE)**, Madrid, Spain, September 3-5 (2014).
3. Q. An, A. N. Rider and E. T. Thostenson, "Epoxy-based carbon nanotube/fiber hybrid composites: nanoscale hybridization via electrophoresis," **Thermoset Resin Formulators Association (TRFA) 2013 Annual Meeting**, Newport, Rhode Island, September 29-October 1, (2013)
4. K. L. Lasater, G. Pandey and E. T. Thostenson, "Carbon Nanotubes For In Situ Thermomechanical And Thermochemical Sensing In Composites," **Proceedings of the 19<sup>th</sup> International Conference on Composite Materials (ICCM-19)**, Montreal, Canada, July 28-August 2, (2013).
5. Q. An, A. N. Rider and E. T. Thostenson, "Carbon nanotube reinforced fiber/epoxy multi-scale hybrid composites via electrophoretic deposition: multifunctional properties, processing, characterization and modeling," **Proceedings of the 19<sup>th</sup> International Conference on Composite Materials (ICCM-19)**, Montreal, Canada, July 28- August 2, (2013).
6. E. T. Thostenson, G. Pandey, Q. An, "Multifunctional Polymer Composites: Hierarchical Micro/Nano Multi-Scale Hybrid Composites for Sensing Applications," **Proceedings of the 28th International Conference of the Polymer Processing Society**, (Keynote Address) Pattaya, Thailand, December 11-15 (2012).
7. G. J. Gallo, E. T. Thostenson, S. Das, C. Cheung, P. Pollock, "Characterization of the Electrical Response of Carbon Fiber/Nanotube Hybrid Composites," **Proceedings of the 44th International SAMPE Technical Conference**, Charleston, SC, October 22-25 (2012).
8. Q. An, A. N. Rider, and E. T. Thostenson, "Mechanical and electrical performance of ultrasonicated and functionalized carbon nanotube-based glass/epoxy composites," **Proceedings of the 44th International SAMPE Technical Conference**, Charleston, SC, October 22-25 (2012).



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9. Q. An, A. N. Rider, and E. T. Thostenson, "Glass fiber / carbon nanotube multiscale hybrid composites via electrophoretic deposition: Processing, characterization and modeling," ***Proceedings of the American Society for Composites 27<sup>th</sup> Annual Technical Conference***, Arlington, TX, October 1-3, (2012)
10. K. L. Lasater, E. T. Thostenson and W. R. Yu "In Situ Monitoring of Cure and Viscoelastic Behavior of Composites Using Carbon Nanotubes", ***Proceedings of the 57th International SAMPE Symposium and Exhibition***, Baltimore, MD, May 21-24, (2012).
11. C. A. Jacob, W. R. Yu and E. T. Thostenson, "Finite element analysis of carbon nanotube reinforced piezoelectric polymer composites", ***Proceedings of the 57th International SAMPE Symposium and Exhibition***, Baltimore, MD, May 21-24, (2012).
12. Q. An, A. N. Rider, E. Yassitepe and E. T. Thostenson, "Controlled-deposition of multi-walled carbon nanotubes on fibers by circulative high-energy sonication and electrophoretic deposition," ***Proceedings of the American Society for Composites 26<sup>th</sup> Annual Technical Conference***, Montreal, CA, September 26-28, (2011).
13. S.-B. Lee, J. W. Yi, S.-K. Lee, J.-H. Byun, E. T. Thostenson, and T-W. Chou, "Damage sensing of carbon nanotubes embedded glass fiber composites based on electrical resistance change," ***Proceedings of the 5th International Conference on Emerging Technologies in Non-Destructive Testing***, Ioannina, Greece, September 19-21, (2011).
14. G. J. Gallo, L. Gao, E. T. Thostenson, T-W. Chou, S. Das, C. Cheung, B. Shen, S. Banerjee, "Health Monitoring of Composite Structures using Carbon Nanotube and Acoustic Sensors," ***8<sup>th</sup> International Workshop on Structural Health Monitoring (IWSHM)***, Palo Alto, CA, September 13-15 (2011).
15. G. Pandey, E. T. Thostenson, D. Heider, "Carbon nanotube network composites for damage detection using time domain reflectometry," ***18<sup>th</sup> International Conference on Composite Materials***, Jeju, Korea, August 21-26, (2011).
16. C. A. Jacob, F. Deng and E. T. Thostenson, "Processing of Nanotube-Reinforced PVDF Nanofibers", ***Proceedings of the 56<sup>th</sup> International SAMPE Symposium and Exhibition***, Long Beach, California, May 23-26, (2011).
17. G. Pandey, E. T. Thostenson and D. Heider, "*In Situ* Health Monitoring of Composites using Carbon Nanotube Networks and Time Domain Reflectometry," ***Proceedings of the 56<sup>th</sup> International SAMPE Symposium and Exhibition***, Long Beach, California, May 23-26, (2011).
18. M. Dempah, L.M. Gao, E.T. Thostenson and T-W. Chou, "Glass Fiber / Carbon Nanotube Composites via a Sizing Approach: Processing and Characterization," ***Proceedings of the 56<sup>th</sup> International SAMPE Symposium and Exhibition***, Long Beach, California, May 23-26, (2011).

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19. L. M. Gao, T-W. Chou and E. T. Thostenson, "Damage Monitoring of a Highly Conductive Polymer Composite under Cyclic and Impact Loading using Carbon Nanotube Network," ***Proceedings of the American Society for Composites 25<sup>th</sup> Annual Technical Conference***, Dayton, OH, September 20-22 (2010).
20. L. M. Gao, T-W. Chou, E. T. Thostenson and Z. G. Zhang, "Damage Sensing in Fiber Composites Using Uniformly and Non-Uniformly Dispersed Carbon Nanotubes," ***Proceedings of the American Society for Composites 25<sup>th</sup> Annual Technical Conference***, Dayton, OH, September 20-22 (2010).
21. A.S. Lim, Z.R. Melrose, E.T. Thostenson, T-W. Chou, "Health Monitoring using Carbon Nanotubes in Adhesively-Bonded Composite-to-Metal Joints," ***Proceedings of the American Society for Composites 25<sup>th</sup> Annual Technical Conference***, Dayton, OH, September 20-22 (2010).
22. E. T. Thostenson, "Starting From Nano: Creating Multifunctional Composites from (Almost) Nothing," ***Proceedings of the American Society for Composites 24<sup>th</sup> Annual Technical Conference***, Newark, DE, September 15-17 (2009).

### **Publications as Research Assistant Professor**

23. E. T. Thostenson and T. W. Chou, "Vinyl Ester Nanocomposites for Damage Sensing in Naval Applications," ***Proceedings of the 17<sup>th</sup> International Conference on Composite Materials***, Edinburgh, Scotland, July 27-31 (2009).
24. T-W. Chou, E. T. Thostenson and L. M. Gao "Advances in the Science and Technology of Carbon Nanotube Composites," ***Proceedings of the 17<sup>th</sup> International Conference on Composite Materials***, Edinburgh, Scotland, July 27-31 (2009).
25. J-W Yi, J-H Jang, W Lee, M-K Um, J-H Byun, H-G Lee, E.T. Thostenson and T.W. Chou, "Mechanical and Electrical Properties of Micro/Nanocomposites via CNT Dispersed Resin Film Infusion Process," ***Proceedings of the 17<sup>th</sup> International Conference on Composite Materials***, Edinburgh, Scotland, July 27-31 (2009).
26. O. Choi, S-B. Lee, J-H. Byun, W. Lee, J-W. Yi, B-S. Kim, E.T. Thostenson and T.W. Chou, "Coating Effects of Copper in CNT/Carbon Fabric Hybrid Composites using Electrophoretic Deposition," ***Proceedings of the 17<sup>th</sup> International Conference on Composite Materials***, Edinburgh, Scotland, July 27-31 (2009).
27. L. M. Gao, E. T. Thostenson, Z. G. Zhang and T-W. Chou "Multifunctional Carbon Nanotube Network Sensors for Damage Sensing and Health Monitoring of Fiber-Reinforced Composites," ***Proceedings of the SAMPE '09, The 54<sup>th</sup> International SAMPE Symposium and Exhibition***, Baltimore, MD, May 18-21 (2009).
28. E. T. Thostenson, L. M. Gao and T-W. Chou, "Carbon Nanotube-Based Sensing of Damage in Fiber Composites". ***50<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference***, Palm Springs, CA, May 4-7 (2009).

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29. A. Gawandi, E. T. Thostenson and J. W. Gillespie Jr., "Experimental Investigation of Tow Pullout Behavior of Aramid Fabric," ***Proceedings of the 9<sup>th</sup> International Conference on Textile Composites (TEXCOMP-9)***, Newark, DE, October 13-15 (2008).
30. E. T. Thostenson, L. M. Gao and T-W. Chou, "Carbon Nanotube Networks: *In situ* Sensing of Damage Evolution in Fiber Composites," ***Proceedings of the 40<sup>th</sup> International SAMPE Technical Conference***, Memphis, TN, September 8-11 (2008).
31. E. T. Thostenson and T-W. Chou, "Scalable Processing Techniques for Nanotube-Based Polymer Composites," ***Proceedings of the 16<sup>th</sup> International Conference on Composite Materials (ICCM-16)***, Kyoto, Japan, July 8-13 (2007).
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### **Publications as Associate Scientist, Postdoctoral Researcher and Graduate Student**

37. E. T. Thostenson and T-W. Chou, "Nanotube-Reinforced Composites: Characterization and Modeling," ***Proceedings of the American Society for Composites 19<sup>th</sup> Annual Technical Conference***, Atlanta, GA, (2004).
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42. E. T. Thostenson and T-W. Chou, "Structure/Property Modeling in Carbon Nanotube-Reinforced Composites," ***Proceedings of the 10<sup>th</sup> International Conference on Composites/Nano Engineering (ICCE-10)***, New Orleans, LA (2004).
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45. E. T. Thostenson, C. Li and T-W. Chou, "Recent research in carbon nanotube composites," ***Proceedings of the 9<sup>th</sup> International Conference on Composites Engineering (ICCE-9)***, (Keynote Address) July 1-6, San Diego, CA (2002).
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47. E. T. Thostenson, Z. F. Ren and T-W. Chou, "Recent Advancements in Carbon Nanotubes and their Composites" ***Proceedings of the 13<sup>th</sup> International Conference on Composite Materials (ICCM-13)*** (Keynote Address) June 25-29, Beijing, China. (2001).
48. E. T. Thostenson, Z. F. Ren and T-W. Chou, "Interfacial Characterization of Carbon Nanotube-Modified Graphite Fiber Composites," ***Proceedings of the 16th Annual Technical Conference of the American Society for Composites*** September 10-12, Blacksburg, VA (2001).
49. E. T. Thostenson, C. Li, Z. F. Ren, and T-W. Chou, "Carbon Nanotube-Based Polymeric Composites," ***Proceedings of the 8<sup>th</sup> International Conference on Composites Engineering (ICCE-8)***, Tenerife, Spain (2001).
50. B. Chen, E. T. Thostenson, and T-W. Chou, "Some Fundamental Issues in Liquid Composite Molding Processes," ***Proceedings of the Sixth Japan International SAMPE Symposium***, Eds. T. Tanimoto and T. Morii, Japan Chapter of SAMPE, p. 35-39, (1999).
51. E. T. Thostenson and T-W. Chou, "Application of Microwave Heating for Adhesive Joining," ***Advances in Aerospace Materials and Structures***, AD-Vol. 58, ASME, p. 89-95, (1999).

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52. E. T. Thostenson and T-W. Chou, "Microwave-Accelerated Curing of Thick Composite Laminates," ***Proceedings of the 13<sup>th</sup> annual meeting of the American Society for Composites (ASC)***, September 21-23, Baltimore, MD, on CD-ROM (1998).
53. E. T. Thostenson and T-W. Chou, "Microwave Processing of Thick-Section Composite Materials," ***Proceedings of the 12<sup>th</sup> annual meeting of the American Society for Composites (ASC)***, October 6-11, Dearborn, MI, p. 931-940 (1997).

### MAJOR INVITED PRESENTATIONS

1. E. T. Thostenson "Multifunctional Carbon Nanotube-Based Composites: *in situ* Self-Sensing of Deformation and Damage," **Department Seminar**, *Department of Aerospace Engineering and Materials Working Group, Mississippi State University, Starkville, MS*, April 28, 2014.
2. E. T. Thostenson "Carbon Nanotube-Based Composites for Structural Health Monitoring," **Department Seminar**, *Department of Mechanical Engineering, Iowa State University, Ames, IA*, April 1, 2014.
3. E. T. Thostenson "Multifunctional Carbon Nanotube-Based Composites: *in situ* Self-Sensing of Deformation and Damage," **Department Seminar**, *Department of Automotive Engineering, Clemson University, Greenville, SC*, March 28, 2014.
4. E. T. Thostenson "Multi-Scale Hybrid Composites: Processing and Characterization for Sensing Applications," **Invited Seminar**, *National Institute of Standards and Technology, Gaithersburg, MD*, November 22, 2013.
5. E. T. Thostenson "Multifunctional Polymer Composites: Hierarchical Micro/Nano Multi-Scale Hybrid Composites for Sensing Applications," **Keynote Speaker**, *28<sup>th</sup> International Conference of Polymer Processing Society (PPS-28)*, Pattaya, Thailand, December 11-15, 2012.
6. E. T. Thostenson "Nanotechnology," **Scientific Tutorial**, *57th International SAMPE Symposium and Exhibition*, Baltimore, MD, May 21, 2012.
7. E. T. Thostenson "Carbon Nanotube-Based Multifunctional Composites for Sensing Applications," **Department Seminar**, *Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC*, October 28, 2011.
8. E. T. Thostenson "Carbon Nanotube Composites: Applications in Sensing and Actuation," **Department Seminar**, *Department of Composite Materials Engineering, Winona State University, Winona, MN*, October 20, 2011.
9. E. T. Thostenson, "Carbon Nanotube-Based Composite Materials: Bridging the Micro and Nano-Scales", **Invited Seminar**, *Korea Institute of Materials Science*, August 18, 2011
10. E. T. Thostenson, "Carbon Nanotube-Based Composite Materials: Bridging the Micro and Nano-Scales", **Department Seminar**, *Department of Materials Science, Seoul National University*, August 19, 2011

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11. E. T. Thostenson "Carbon Nanotube-Based Multifunctional Composites," **Keynote Speaker**, *SPE Polymer Nanocomposites Conference*, Lehigh University, Bethlehem PA March 7-9, 2011.
12. E. T. Thostenson "Carbon Nanotube-Based Composite Materials: Bridging Micro and Nano Scales," **Professional Chapter Seminar**, *ASME Delaware Section*, November 17, 2010.
13. E. T. Thostenson "Carbon Nanotube/Fiber Multi-Scale Hybrid Composites for Sensing Applications," **Invited Speaker**, *Carbon Nanotubes for Space Applications Interchange Meeting*, The Aerospace Corporation, El Segundo, CA March 16-17, 2010.
14. E. T. Thostenson "Carbon Nanotube-Based Composite Materials for Sensing Applications," **Department Seminar**, *Department of Mechanical Engineering, City College of New York*, March 11, 2010.
15. E. T. Thostenson "Multi-Scale Nanotube/Fiber Hybrid Composites for Damage Sensing Applications," **Plenary Lecture**, European Cooperation in Science and Technology (COST) Workshop and Nanomaterials Symposium *15<sup>th</sup> International Conference on Composite Structures (ICCS15)*, Porto, Portugal, June 15-17, 2009.
16. E. T. Thostenson, "Multi-Scale Carbon Nanotube - Carbon Fiber Reinforcement for Advanced Epoxy Composites," **Plenary Lecture**, *2<sup>nd</sup> AEMAC (Asociación Española de Materiales Compuestos) Workshop on Nanocomposites*, University of Rey Juan Carlos, Madrid, Spain, May 29, 2009.
17. E. T. Thostenson "Carbon Nanotube-Based Composite Materials: Bridging the Micro and Nano Scales," **Department Seminar**, *Mechanical Engineering and Mechanics (MEM)*, *Lehigh University*, November 10, 2008.
18. E. T. Thostenson, "Nanostructured Composite Materials," **Featured Speaker** (2-hour workshop) *IDGA Next Generation Materials for Defense 2007*, Nanomaterials Focus Day, Arlington, VA, March 27, 2007.