

CURRENT ACADEMIC POSITION

Sustainable Product Design and Innovation, Keene State College, Keene, NH 2020-present
Assistant Professor, Tenure Track

EDUCATION

Montana State University, Bozeman, MT 2013

Doctorate of Philosophy in Mechanical Engineering

PhD Dissertation: "A Comparison of Continuum and Discrete Modeling Techniques of the Effects of Manufacturing Defects Common to Composite Structures"

University of Utah, Salt Lake City, UT 2007 (both)

Master of Science and Bachelor of Science in Mechanical Engineering

MS Thesis: "Development of Bonding Methods for Thermoplastic Advanced Composites"

Bates College Lewiston, ME 1997

Bachelor of Science in Philosophy

BS Thesis: "Visualization, the Mind, and the Body: An Account of Visualization and its Compatibility to Descartes', the Behaviorist/Functionalist, and the Eliminative Materialist Views"

OTHER AFFILIATIONS

Department of Mechanical & Industrial Engineering, Montana State University, Bozeman, MT 2020-2021

Visiting Research Associate (Summers)

Assist in development of stretch broken carbon fiber material format. Focus on manufacturing, material characterization and modeling of material and processing responses.

Hudson Valley Textile Project, Hudson Valley, NY 2018-present

Technical Officer, Board of Directors

The Hudson Valley Textile Project recognizes, celebrates and supports a sustainable model of regionally sourced, processed, and manufactured fiber products. Technical advisor to Board for scientific endeavours of to help meet the Project's mission and benefit affiliated fiber producers.

Pursuit Cycles, Bozeman, MT 2016-present

Founding Partner & Director of Engineering

Overseeing the engineering aspects of a carbon fiber bicycle frame startup where all frames are made by hand in Bozeman, MT. Pursuit has a focus on high quality of a highly engineered, cutting edge product.

JW Engineering, Bozeman, MT 2005-present

Principal Consultant

A full-service engineering firm specializing in use and manufacture of advanced composite materials with a mission to perpetuate the proper and efficient use of advanced composites while minimizing costs by utilizing the most efficient tools, materials and methods available. Projects include: development of carbon fiber bicycle production capabilities; summarization of best practices for machining of carbon fiber tubes and parts; analysis of stresses on failed gas line that led to explosion; generation of detailed CAD models and drawing packages for medical products, consumer electronics, and sporting goods; and, FEA analysis of consumer and sporting goods.

PROFESSIONAL EXPERIENCE

Division of Engineering Programs, State University of New York at New Paltz, NY 2014-2020

Assistant Professor, Tenure Track

Launched a new mechanical engineering program with successful ABET accreditation (6-year term). Developed and taught undergraduate mechanics and design courses. Built research program to investigate processing-to-performance relationships of materials. Extensive service to department, university, community, and profession.

Sunstrand LLC, Louisville, KY 2014-2019

Principal Engineer & Chief Science Officer

Provide guidance on testing and data interpretation to ensure clear, consistent, and accurate background for product development and the scientific company message. Sunstrand is a world leading supplier of sustainable, natural materials.

Department of Mechanical & Industrial Engineering, Montana State University, Bozeman, MT Spring 2014

Non-Tenure Track Faculty, Teaching Professor

Taught Composite Materials: Structure and properties of composite materials and design procedures for composite structures. Overview of advanced composite types, manufacturing considerations, and industry insights.

Gradient Engineering, Bozeman, MT 2013-2014

Principal Consultant

Gradient Engineering is focused on development of methods of extraction and treatments for utilization of natural bamboo fibers in composite materials. Performed duties to assist in engineering aspects of this endeavor. Duties include: assist with lab build-out and experimentation; facilitation, analysis, and reporting on the mechanical testing program; general guidance on lab initiatives and organization; and provide research and insight into product manufacturing and end user applications.

Department of Mechanical & Industrial Engineering, Montana State University, Bozeman, MT 2007-2013

Doctoral Research Assistant

Research Focus: Investigate the Effects of Defects in composite wind turbine blades resulting from common manufacturing practices as part of the Blade Reliability Collaborative. Determine material properties and progressive damage of representative materials and flaws. Generate and compare predictive continuum and discrete progressive damage models considering local effects on global model.

Department of Mechanical Engineering, University of Utah, Salt Lake City, UT 2003-2007

Undergraduate & Graduate Research Assistant

Research Focus: Research viable methods of bonding nylon and polypropylene thermoplastic composite materials without reconsolidation. Qualitative and quantitative investigations of different adhesives and surface treatments effects on bond strength for automotive applications.

Ray Publishing, Denver, CO 2004-2006

Contributing Writer

Focus: Investigated and authored feature length articles for two magazines focusing on the advanced composite material industry: High Performance Composites Magazine and Composites Technology Magazine. Article topics included a mold release survey, composite usage to improve fuel economy in the trucking industry, composite rebar, carbon fiber usage in several sporting good products, and a review of the manufacture of a carbon fiber automotive body panel.

MedQuest Products Inc., Salt Lake City, UT 2004-2005

Engineering Associate

Focus: Assisted on various projects related to the testing and development of a surgically implanted left ventricular assistive device. Projects included designing seals, design of a rotor removal tool, writing of specification and process documents, testing titanium polishing methods, and research products used in assembly.

MacLean Automotive Composites, West Jordan, UT 2002-2004*Manufacturing Engineer*

Focus: Developed product and production process for the company's first automotive venture; the first ever production molded carbon fiber body panel with a Class "A" surface in the automotive industry. Duties included: developed ply patterns for complex body panels using carbon fiber pre-preg; developed the first ever process to allow carbon fiber composite part to be paintline ready immediately off the tool with no additional hand-work; managed the production team and materials and designed and organized production flow; worked with customer and quality engineer to install systems and perform training to ensure quality standards were met and corrective actions taken; assisted in installing and optimizing production machines and systems, including an autoclave and a 5-axis router; designed, oversaw and presented results from many studies to ascertain and resolve issues; and first member of a successful team in achieving both PPAP and Run-at-Rate within 11 months of project launch.

MacLean Quality Composites, West Jordan, UT 2000-2002*Production Manager*

Focus: Managed a production facility specializing in roll-wrapped and filament wound carbon fiber tubing with four departments and over 60 employees. Part of a team to successfully implement an ERP system. Helped reduce costs and refocus each department on jobs that were profitable. Oversaw production launch of several carbon fiber products.

Seven Cycles, Watertown, MA 1999-2000*Machinist/Sales Support*

Focus: Machined titanium and carbon fiber tubing to be made into premium quality custom bicycles. Designed and implemented Kanban and other inventory management systems. Offered sales support to customers and bicycle dealers while maintaining customer and dealer databases.

Spinergy Wheels, Wilton, CT 1999*Sales Support*

Focus: Sold and offered technical support for innovative 4-spoke carbon fiber wheels to independent bicycle dealers across the US and Canada.

Gould Academy, Bethel, ME 1998-1999*Men's Alpine Ski Coach*

Focus: Coached and mentored freshman and sophomore age boys to become better alpine ski racers, better students, and better human beings.

FELLOWSHIPS, AWARDS & GRANTS

1. KSC School of Sciences, Sustainability, and Health Student Research Stipend for *Bio-Industrial Material Testing* (Keene, NH), student salaries, spring 2021.
2. KSC Teaching Fellow (Keene, NH), AY 2020-2021.
3. SUNY New Paltz AC² Summer Research Program for *Feasibility of establishing wool and alpaca grading services at SUNY New Paltz* (New Paltz, NY), student & summer salary, summer 2019.
4. SUNY New Paltz, AYURE: "Bio-Industrial Material Testing (Independent Study Fall 2018)," \$750 equipment budget, fall 2018.
5. SUNY New Paltz Sustainability Faculty Fellow (New Paltz, NY), AY 2018-2019.
6. SUNY New Paltz AC² Summer Research Program for *Identification of Key Natural Fiber Parameters for Development of Standard Testing Methodology* (New Paltz, NY), student & summer salary, summer 2018.

7. FuzeHub: Jeff Lawrence Innovation Award for *Equipment Investment to Facilitate Standardized Test Methods for Material Properties of Natural Fibers* (New Paltz, NY), \$75,000, January 1, 2018 to April 30, 2018.
8. Additive Manufacturing and Multifunctional Printing (AMPrint) Center at Rochester Institute of Technology for *Comparison of Material Performance of 3D Printed Composites Versus Traditionally Manufactured Parts* (New Paltz, NY), \$16,125, April 1, 2017 to March 31, 2018.
9. SUNY Network of Excellence in Materials & Additive Manufacturing grant to establish *Processing-Structure-Properties-Performance Relationship for Fused Deposition Modeling* (New Paltz, NY), \$25,000, May 1, 2015 to April 30, 2016.
10. SUNY New Paltz Summer Undergraduate Research Experience for *Use of Digital Image Correlation to Reduce Material Testing Requirements for Carbon Fiber Reinforced Plastics Qualification* to support Christian Zoeger (New Paltz, NY), student & summer salary, summer 2015.
11. Western Transportation Institute Graduate Student Fellowship to research the impacts of buried surface hoar within a snowpack on avalanche release and mitigation (Bozeman, MT), 2008-2009.
12. NSF EAPSI Grant to study at Japan's Snow and Ice Research Center (Nagaoka, Japan), summer 2008.
13. Benjamin Fellowship to initiate PhD program at Montana State University (Bozeman, MT), 2007-2008.

THESIS & SPECIAL PROJECT ADVISING

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| 2020-present | Noah Loomis, (MS Mechanical Engineering, Montana State University), Graduate Committee Member, MSU Stretch Broken Carbon Fiber Project |
| 2020-present | Yoni Shchemelinin, (PhD Mechanical Engineering, Montana State University), Graduate Committee Member, MSU Stretch Broken Carbon Fiber Project |
| 2019-2020 | Jacqueline Taylor & Hadi Rabadi, (Independent Research Study), Adviser, "Continued Assessment of Variability of Natural Fiber Materials" |
| 2018-2019 | Hanami Robles, (Undergraduate Honors Thesis), Adviser, "Underrepresented Minority Students in STEM," http://hdl.handle.net/1951/70787 |
| 2018-2019 | Hanami Robles & Bryan Feigel, (Independent Research Study), Adviser, "Assessment of Variability of Natural Bio-Materials for Industrial Use" |
| 2017-2018 | Megan Gangwere, (Undergraduate Honors Thesis), Adviser, "Engineering with a Purpose: Nontraditional Perspectives," http://hdl.handle.net/1951/70261 |
| Fall 2017 | Sigmund Bereday, (Independent Research Study), Adviser, "Review of Hemp and Natural Fiber Processing and Testing" |
| 2014-2015 | Michael W. Lerman, (MS Mechanical Engineering, Montana State University) Committee Member, "Investigation of the Effects of In-Plane Fiber Waviness in Composite Materials through Multiple Scales of Testing and Finite Element Modeling," https://scholarworks.montana.edu/xmlui/handle/1/9058 |
| 2013-2014 | Tammy N. Ritchey, (MS Mechanical Engineering, Montana State University) Committee Member, "Development of Failure Criteria and Experimental Testing for Composite Adhesively Bonded Scarf Repairs Utilizing Structural Paste Adhesives," https://scholarworks.montana.edu/xmlui/handle/1/8692 |

WORK IN PROGRESS

† Indicates undergraduate researcher(s)

1. Yang, J., D. Walczyk, J. Nelson, R. Bucinell, and J. Gilbert-Jenkins. Hemp Decortication using a Mastication Process, *Journal of Natural Fibers*, Submitted: January 2020.
2. Development of Bio-Industrial Materials Institute (BMI) with the mission of collaboratively establishing this understanding of bio-industrial materials from bast plants, their opportunities, and how to economically process them into useful products, through partnerships, to increase their competitiveness and material use.
3. † Research Project: *Development of natural fiber testing protocol and services*. In partnership with the Hudson Valley Textile Project. Estimated Completion: Ongoing
4. † Journal Publication: "Comparison of mechanical performance of 3D printed polymers to injection molding." Estimated submission: Q4 2021.
5. Continued consultancies with Hudson Valley Textile Project and Pursuit Cycles (Bozeman, MT).

PEER-REVIEWED PUBLICATIONS

† Indicates undergraduate researcher(s); # Indicates invited publication

1. † Nelson, J.W., Atkins, D., Gottstine, M.L., Yang, J., Garapic, G., Jaminion, S., and Nelson, A. Generalized Models for Unidirectional Anisotropic Properties of 3D Printed Polymers, *Rapid Prototyping Journal*, Submitted: March 2019 [Manuscript ID: RPJ-03-2019-0083].
2. †# Feigel, B.; Robles, H.; Nelson, J.W.; Whaley, J.M.; Bright, L.J.: Assessment of Mechanical Property Variation of As-Processed Bast Fibers. *Sustainability* 2019, 11, 2655. <https://doi.org/10.3390/su11092655>
3. # Riddle, T., J. Nelson, P. Flaherty 2019. Chapter 3: Hemp Fibers. In: D.W. Williams, editor, *Industrial Hemp as a Modern Commodity Crop*, ASA CSSA and SSSA, Madison, WI. p. 37-57. [doi:10.2134/industrialhemp.c3](https://doi.org/10.2134/industrialhemp.c3)
4. Riddle, T. W., Nelson, J. W., and Cairns, D. S.: Effects of defects in composite wind turbine blades – Part 3: A framework for treating defects as uncertainty variables for blade analysis, *Wind Energ. Sci.*, 3, 107-120, <https://doi.org/10.5194/wes-3-107-2018>, 2018.
5. Nelson, J. W., Riddle, T. W., and Cairns, D. S.: Effects of defects in composite wind turbine blades – Part 1: Characterization and mechanical testing, *Wind Energ. Sci.*, 2, 641-652, <https://doi.org/10.5194/wes-2-641-2017>, 2017.
6. Nelson, J. W., Riddle, T. W., and Cairns, D. S.: Effects of defects in composite wind turbine blades – Part 2: Progressive damage modeling of fiberglass-reinforced epoxy composites with manufacturing-induced waves, *Wind Energ. Sci.*, 2, 653-669, <https://doi.org/10.5194/wes-2-653-2017>, 2017.
7. Cairns, D. S., Nelson, J. W., Woo, K., & Miller, D.: Progressive damage analysis and testing of composite laminates with fiber waves. *Composites Part A: Applied Science and Manufacturing*, 90, 51-61, 2016.
8. # Tsai, S and Melo JDD. "Composite Materials Design and Testing" Stanford, 2015. ISBN: 978-0-0960845-1-5 [Contribution of Chapter 12: "Mechanical Testing of Composites" pp. 421-450].
9. Riddle, T.W.; Nelson, J.W.; & Cairns D.S.: Use of Damage Progression and Probabilistic Modeling for Defect Risk Management & Improved Reliability of Composite Wind Turbine Blades., *J of the Reliability Information Analysis Center*, August 2012.

PROCEEDINGS, PRESENTATIONS & POSTERS

† Indicates undergraduate researcher(s); # Indicates invited publication

1. Nelson, Jared W., Ronald B. Bucinell, and Daniel Walczyk. "Bio-Industrial Materials Institute: Characterization of Natural Fiber Material Property Variability." *Proceedings of the American Society for Composites—Thirty-fourth Technical Conference*. October 2019.
2. Smart, LB., Gilbert Jenkins, J., and Nelson, JW. 2019. "Research Report from New York's Institutions of Higher Education," Eastern US Hemp Growers Conference & Expo, Albany, NY. June 4, 2019.
3. † Feigel, B., H. Robles, Q. Fowler, A. Vakarchuk, J.W. Nelson & L. Bright Nelson, 2019. "Assessing Variability of As-Processed Bast Fibers," *25th Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 3, 2019.
4. Composites Design Workshop XVII: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" January 19-23, 2019.
5. *†Robles, H., Feigel, B., and Nelson, JW. 2018. "Investigating Material Property Variability of Natural Fibers," CAMX 2018 Poster Session: Dallas, TX. October 15-18, 2018.
6. †Robles, H., Castellanos, M., Pero, M., and Nelson, JW. 2018. "Assessing Variability of Natural Fibers," McNair Scholars Program: University at Buffalo Undergraduate Research Conference, Niagara Falls, NY. July 19-21, 2018.
7. Nelson, JW. 2018. "Food, Fiber, and Future Market Opportunities (Panelist)," Southern Tier Hemp Summit: Castetter Sustainability Group Inc., Binghamton, NY. June 29, 2018.
8. †Robles, H., Feigel, B., and Nelson, JW. 2018. "Testing and specifying fiber properties," Hudson Valley Textile Project Summit, New Paltz, NY. June 20, 2018.
9. Composites Design Workshop XVI: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" June 4-8, 2018.
10. Smart, LB., Gilbert Jenkins, J., and Nelson, JW. 2018. "Research Report from New York's Institutions of Higher Education," Eastern US Hemp Growers Conference & Expo, Albany, NY. June 5, 2018.
11. Riddle, TW, and Nelson, JW. 2018. "Hemp Fiber Processing & the Stalk's Extraordinary Potential," Eastern US Hemp Growers Conference & Expo, Albany, NY. June 5, 2018.
12. Nelson, JW. 2018. Hemp Symposium Panelist, WhatCannaDo & Chenango Links, Norwich, NY. May 7, 2018.
13. †Reap, J., Bereday, S., and Nelson, JW. 2018. "Quantifying Mechanical Properties of Natural Fibers," *24rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 4, 2018.
14. †Gottstine, M., Hanna, R., Nelson, JW, and Garapic, G. 2018. "SEM Imaging of Fracture Surfaces and Porosity of 3D Printed Polymers," *24rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 4, 2018.
15. †Gottstine, M., Hanna, R., and Nelson, JW. 2018. "Mechanical Properties of 3D Printed Composites," *24rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 4, 2018.
16. †Feigel, B., Rihm, T., and Nelson, JW. 2018. "Use of Advanced Dimensional Analysis for Wool Fiber Grading," *24rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 4, 2018.
17. Composites Design Workshop XV: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" January 20-24, 2018.
18. *†Lai, HL, Kuang, C, and Nelson, JW. 2017. "Modeling and experimental characterization of viscoelastic 3D printed spring/damper systems," *ASME 2017 International Mechanical Engineering Congress and Exposition*, ASME, Tampa, FL, November 6, 2017.

19. Composites Design Workshop XIV: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" July 10, 2017.
20. †Atkins, D, Gottstine, M, and Nelson, JW. 2017. "Anisotropic Effects of Print Orientation on Mechanical Properties of 3D Printed Polymers," *23rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 5, 2017.
21. †Huang, J, and Nelson, JW. 2017. "Comparison of Mechanical Performance of 3D Printed Polymers to Injection Molding," *23rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 5, 2017.
22. †Yang, J, Zoeger, C, Atkins, D, Huang, J, and Nelson, JW. 2017. "Effect of Common Print Parameters on the Mechanical Properties of the Produced Parts," *23rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 5, 2017.
23. †Zoeger, C, Yang, J, and Nelson, JW. 2017. "Use of Digital Image Correlation to Find Material Properties of Carbon Fiber Composites," *23rd Annual SUNY New Paltz Student Research Symposium: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz. May 5, 2017.
24. Composites Design Workshop XIII: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" March 14, 2017.
25. Nelson, JW. 2016 "Optimization of CFRP Bicycle Frame Laminates Through Simplified, Real-world Testing Aided by Digital Image Correlation," *Cyclitech*, JEC, Newport Beach, CA. December 6, 2016.
26. *†Zoegger, C, Nelson, JW, Atkins, D, Huang, J, and Yang, J. (2016). "Use of Digital Image Correlation to Find Compressive Material Properties of Carbon Fiber Composites," *ASME 2017 International Mechanical Engineering Congress and Exposition*, Phoenix, AZ. November 13, 2016.
27. *†Atkins, D, Nelson, JW, Zoegger, C, Yang, J, and Huang, J. 2016. "Effect of Common Print Parameters on the Mechanical Properties of the Produced Parts," *ASME 2017 International Mechanical Engineering Congress and Exposition*, Phoenix, AZ. November 13, 2016.
28. Jaminion, S. and Nelson, JW. 2016. "Utilization of CorreliSTC Digital Image Correlation Software to Characterize Multi-Scale Composite Material and Structural Properties," *iDICs 2016 Conference and Workshop/SEM Fall Conference*, Philadelphia, PA. November 9, 2016.
29. Composites Design Workshop XII: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" June 22, 2016.
30. Jaminion, S, Nelson, JW. 2016. "Utilization of CorreliSTC Digital Image Correlation Software to Characterize Multi-Scale Composite Material and Structural Properties," *JEC Americas*, Atlanta, GA. April 6, 2016.
31. Composites Design Workshop XI: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" February 5, 2016.
32. *Nelson, JW, AS Nettles, and DS Cairns. 2015. "Utilization of Digital Image Correlation to Improve and Reduce Composite Material Characterization Testing," *CAMX 2015 Conference Proceedings*: Dallas, TX, pp 1783-1804.
33. *Riddle, TW and Nelson, JW. 2015. "Assessment of Composite Properties Utilizing Short Discontinuous Natural Fibers," *CAMX 2015 Conference Proceedings*: Dallas, TX, pp 1805-1816.
34. *Lerman, MW, Nelson, JW, and DS Cairns. 2015. "Investigation of the Effect of In-Plane Fiber Waviness in Composite Materials Through Testing and Finite Element Analysis," *CAMX 2015 Conference Proceedings*: Dallas, TX, pp 1269-1285.
35. †Adkins, D, and Nelson JW. 2015. "A mechanics of materials approach to better understand what we print and how we can use it," *ANYthing Conference Presentation*: SUNY RF and SUNY New Paltz, New Paltz, NY, Nov 2015.
36. †Zoeger, Christian and Jared Nelson. 2015. "Use of Digital Image Correlation to Find Design Allowables of Composite Materials," *SURE Final Presesntation: The Research, Scholarship, and Creative Activities Program*, SUNY New Paltz, New Paltz, NY, Sept 2015.

37. Composites Design Workshop X: An Intensive, Online, Live, Certificated Training by Stanford University. Session Presentation: "Mechanical Testing of Composites" July 16, 2015.
38. Cairns, Douglas S., Riddle, William, Nelson, Jared, and Peterson, William. Wind Turbine Development at Montana State University. United States: N., doi:10.2172/1342772, 2015.
39. *Riddle, TW and Nelson, JW. 2014. "Effects of Various Surface Treatments on Natural Fiber Morphology and Composite Properties," CAMX 2014 Conference Proceedings: Orlando, FL, pp 1123-1135.
40. *Nelson, Jared W.; Cairns, Douglas S.; Riddle, Trey W.; & Peterson, W. Matt (2014). "Reliability and Progressive Damage Modeling of Composite Structures with Manufacturing Defects." *SAMPE Seattle 2014: Annual Tech Conference and Exhibition*; Seattle, WA, June 2014.
41. Nelson, Jared W.; Cairns, Douglas S.; Nettles, Alan T.; & Tsai, Stephen (2014). "Utilization of Digital Image Correlation in Open Hole Testing of Composite Laminates." *JEC Composites*, 88.
42. *Riddle, Trey W.; Cairns, Douglas S.; & Nelson, Jared W. (2013). "Effects of Defects: Part A—Stochastic Finite Element Modeling of Wind Turbine Blades with Manufacturing Defects." *54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Boston, MA, April 2013.
43. *Woo, Kyeongsik; Nelson, Jared W.; Cairns, Douglas S.; & Riddle, Trey W. (2013). "Effects of Defects: Part B—Progressive Damage Modeling of Fiberglass/Epoxy Composite Structures with Manufacturing Induced Flaws Utilizing Cohesive Zone Elements." *54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Boston, MA, April 2013.
44. *Riddle, Trey W.; Donnelly, Patrick; Cairns, Douglas S.; & Nelson, Jared W. (2013). "Use of Statistical Learning in a Reliability Program for Risk Assessment of Composite Structures with Defects" *54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Boston, MA, April 2013.
45. Cairns, Douglas S.; Nelson, Jared W.; Riddle, Trey W.; & Peterson, W. Matt (Annually). "Blade Reliability Collaborative: Effects of Defects Annual Contract Review." Dec 2010, 2011, & 2012.
46. Nelson, Jared W.; Cairns, Douglas S.; Riddle, Trey W.; & Paquette, Josh A. (2012). "Composite Wind Turbine Blade Effects of Defects: Improved Reliability of Composite Structures Utilizing Progressive Damage Modeling (Poster)." *The Science of Making Torque from Wind*; Oldenburg, Germany, Oct 9-11, 2012.
47. Nelson, Jared W.; Cairns, Douglas S.; Riddle, Trey W.; & Peterson, W. Matt (2012). "Blade Reliability Collaborative: Effects of Defects." *NAWEA Inaugural Meeting*; Amherst, MA, Aug 7-9, 2012.
48. *†Riddle, T.W.; Nelson, J.W.; Cairns D.S.; & Workman, J.E. (2012). "Composite Wind Turbine Blade Effects of Defects: Part A - Development of a Protocol for Defect Risk Management & Improved Reliability of Composite Structures." *53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Honolulu, HI, April 2012.
49. *†Nelson, J.W.; Riddle, T.W.; Cairns D.S.; & Workman, J.E. (2012). "Composite Wind Turbine Blade Effects of Defects: Part B—Progressive Damage Modeling of Fiberglass/Epoxy Laminates with Manufacturing Induced Flaws." *53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Honolulu, HI, April 2012.
50. Nelson, Jared W.; Cairns, Douglas S.; Riddle, Trey W.; & Peterson, W. Matt (2012). "Blade Reliability Collaborative: Effects of Defects." *NREL Wind Technology Center Seminar*; Boulder, CO, Mar 8, 2012.
51. Cairns, Douglas S.; Nelson, Jared W.; Riddle, Trey W.; & Peterson, W. Matt (2012). "Criticality of Defects in Wind Turbine Blade Materials and Manufacturing." *Materials Challenges in Alternative & Renewable Energy*; Clearwater, FL, Feb 26-Mar 1, 2012.
52. Riddle, T.W.; Nelson, J.W.; & Cairns D.S. (2012). "Effects of Defects in Composite Wind Turbine Blades Round 2 Report—SANDIA Blade Reliability Collaborative." *SANDIA Report: SAND2012-XXXX*, Sandia National Laboratory, Albuquerque, NM, Jan 2012.
53. Riddle, T.W.; Nelson, J.W.; & Cairns D.S. (2011). "Effects of Defects in Composite Wind Turbine Blades Round 1 Report—SANDIA Blade Reliability Collaborative." *SANDIA Report: SAND2011-XXXX*, Sandia National Laboratory, Albuquerque, NM, June 2011.

54. *Riddle, T.W.; Nelson, J.W.; & Cairns D.S. (2011). "Characterization of Manufacturing Defects Common to Composite Wind Turbine Blades: Flaw Characterization." *52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Denver, CO, April 2011.
55. *Nelson, J.W.; Riddle, T.W.; & Cairns D.S. (2011). "Characterization of Manufacturing Defects Common to Composite Wind Turbine Blades: Effects of Defects." *52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*; Denver, CO, April 2011.
56. Nelson, J.W. & Cairns D.S. (2012). "Montana State University's Wind Research Programs." *Leadership Montana Annual Meeting*; Bozeman, MT, March 25, 2011.
57. Riddle, T.W.; Nelson, J.W.; & Cairns D.S. (2011). "Montana State University's Blade Reliability Collaborative Subtask—Effects of Defects." *Wind Montana Annual Meeting*; Bozeman, MT, March 25, 2011.
58. Cairns D.S.; Nelson, J.W.; & Riddle, T.W. (2010). "Wind Turbine Composite Blade Manufacturing: The Need for Understanding Defect Origins, Prevalence, Implications and Reliability." *SANDIA Report: SAND11-1094*. Sandia National Laboratory, Albuquerque, NM, June 2010.
59. Nelson, Jared W. (2008). "Metamorphosis of Depth Hoar in an Isothermal Snowpack—Final Report (SP08046)." *National Science Foundation & Japan Society for the Promotion of Science*. August 18, 2008.
60. Nelson, Jared W. (2008). "Overview of Snow Research and Capabilities of Montana State University." *National Research Institute for Earth Science and Disaster Prevention: Snow and Ice Research Center Seminar*, Nagaoka, Japan, June 18, 2008.
61. †Binger, Christopher; Nelson, Jared W.; & Olson, Kristofor A. (2006). "Explosive Shock Wave Compression in Snow: Effects of Explosive Orientation and Snowpack Compression (Poster)." *International Snow Science Workshop*, Telluride, CO, October 1-6, 2006.

TEACHING ACTIVITIES

Courses taught at Keene State College:

IISPDI 151: Product Design Principles
 SPDI 221: 3-D CADD
 SPDI 351: Product Design II
 SPDI 302: Properties of Materials (newly developed)

Courses developed and taught at SUNY New Paltz:

EGM 201: Design using Reverse Engineering
 EGM 211: Statics
 EGM 221: Engineering Materials
 EGM 322: Mechanics of Materials
 EGM 323: Mechanics of Materials Lab
 EGM 302: Finite Element Analysis
 EGM 393: Introduction to Composites
 EGM 393: Design of Machine Elements
 EGM 293/493: Independent Study
 HON 393: Innovation & Intelligence (first offering spring 2020)

Courses taught at SUNY New Paltz:

EGG 101 Introduction to Engineering
 EGG 409 Sr Design Project 2 (average 3 teams/year)

Courses taught at Montana State University:

EMAT 463: Composite Materials

SCHOLARLY & PROFESSIONAL SERVICE

Department and University:

Moderator, Sustainable Product Design and Innovation Retreat (2021)
Fellow, Keene State College Teaching Fellows (2020-2021)
Member, Provost Search Committee (2019-2020)
Chair, Division of Engineering Programs Personnel (RTP) Committee (2018-2020)
Member, Fine Arts Search Committee (Metals) (2019-2020)
Coordinator, Oversaw sections of EGM323: Mechanics of Materials Lab with several instructors (fall 2018, fall 2019)
Member, Mechanical Engineering Curriculum Committee (2014-2020)
Reviewer, Physics End-of-Semester Poster Sessions (2014-2020)
Chair, Senior Design Evaluation & Improvement Committee (2018-2019)
Member, Engineering Scholarship Committee (2014-2019)
Member, Engineering Lecturer Search Committee, 1 hire (2016-2017)
Member, Division of Engineering Programs Personnel (RTP) Committee (2016-2017)
Member, Division of Engineering Programs Assessment Committee (2015-2017)
Member, General Education Board (2015-2017)
Member, Innovation Hub Design & Review Committee (2015-2018)
Member, Mechanical Engineering Faculty Search Committee, 1 hire (2015-2016)
Member, Mechanical Engineering Faculty Search Committee, 1 hire (2014-2015)
Member, Senior Design 1 Evaluation & Improvement Committee (2014-2015)
Representative, University Open Houses and Accepted Student Days (2014-present)

Professional:

Board of Directors, Hudson Valley Textile Project, NY (2017-present)
Session Chair at CAMX: The Composites and Advanced Materials Expo, Dallas, TX (Oct. 2015)
Session Chair, ANYthing Conference, New Paltz, NY (Nov. 2015)
Organizing Committee, formation and meeting of SUNY Industrial Hemp Research Working Group (2018)
Program Committee, Industrial Hemp Roundtable Summit (2018)

Reviewer for: Journal of Reinforced Plastics; Rapid Prototyping Journal; CAMX: The Composites and Advanced Materials Expo, Society for the Advancement of Material and Process Engineering; & American Institute of Aeronautics and Astronautics: Structures, Structural Dynamics, and Materials Conference