



Ryan Berke, Assistant Professor
Mechanical & Aerospace Engineering
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EDUCATION

- Postdoc, Aerospace Engineering, University of Illinois, Urbana-Champaign, IL. *Jan. 2013 – Sept. 2014*
Ultraviolet Digital Image Correlation (UV-DIC) for High Temperature Applications
Advisor: Professor John Lambros
- PhD, Mechanical Engineering, The Ohio State University, Columbus, OH. *June 2008 – Jan. 2013*
Mechanical Characterization of Solid Oxide Fuel Cell Electrolytes with Honeycomb Support
Advisor: Professor Mark E. Walter
- B.S., Mechanical Engineering, University of Maryland, College Park, MD. *Aug. 2003 – May 2008*
Minor in Physics, QUEST Honors Program, Concentration in Solid Mechanics

HONORS & AWARDS

1. University-wide Outstanding Undergraduate Research Mentor of the Year, Utah State University, 2019.
2. College of Engineering Outstanding Undergraduate Research Mentor of the Year, Utah State University, 2019.
3. MAE Outstanding Undergraduate Research Mentor of the Year, Utah State University, 2019.
4. AFRL Summer Faculty Fellowship Program, Wright-Patterson AFB, 2018
5. MAE Outstanding Undergraduate Research Mentor of the Year, Utah State University, 2018.
6. AFRL Summer Faculty Fellowship Program, Wright-Patterson AFB, 2017
7. MAE Outstanding Undergraduate Research Mentor of the Year, Utah State University, 2017.
8. MAE Outstanding Undergraduate Research Mentor of the Year, Utah State University, 2016.
9. Haythornthwaite Foundation Student Travel Award and Paper Competition, ASME-IMECE 2012.
10. Ray Travel Award, The Ohio State University Council of Graduate Students, Fall 2012.
11. NSF Student Travel Award and Poster Competition, Finalist, ASME-IMECE 2011.
12. General Topics Poster Competition, 3rd Place (of 95 participants), ASME-IMECE 2011.
13. Distinguished University Fellowship, Ohio State University, 2008-'09 & 2011-'12 academic years.

RESEARCH EXPERIENCE

- Assistant Professor, Utah State University. *Jan. 2015 – Present*
- Director of the Mechanics at Extreme Temperatures Lab (www.berkelab.com)
- Director of the Thermal Hydraulics and Material Properties Center (<http://nuclear.usu.edu/>)
- Visiting Researcher, Wright-Patterson AFB. *June-Aug. 2017, 2018*
- Postdoctoral Researcher, University of Illinois, Urbana-Champaign. *Jan. 2013 – Dec. 2014*
- Graduate Research Associate, The Ohio State University. *June 2008 – Jan. 2013*
- Co-Op Student, National Institute of Standards and Technology (NIST). *Jan. 2005 – Aug. 2007*

RESEARCH INTERESTS

Solid Mechanics: Thermo-mechanical loading, fracture, fatigue, creep, environmental effects.

Advanced Material Systems: High temperature materials, multi-scale structures, advanced energy systems, aerospace vehicles, nuclear structural materials, accident tolerant fuels.

Experimental Methods: High-temperature measurements, in-situ methods, resonant ultrasound spectroscopy, 2-D and 3-D digital image correlation, high-throughput techniques.

Education: Graduate and undergraduate research, participation of underrepresented populations

PAST AND CURRENT SUPPORT**Past and Current Support (awarded as PI)**

1. AFRL/RQTI, "High Temperature Optical Strain Measurements for Vibration-based Fatigue Testing," **\$25,531**, 09/01/19 – 08/31/20.
2. NRC, "Graduate Fellowship Program to Promote Nuclear Engineering Research at Utah State University," **\$400,000**, 08/30/19 – 08/29/23.
3. ASME TEC Development Funds, "2019 IMECE Student Paper Competition for Experimental Mechanics," **\$5,250**, 07/01/19 – 06/30/20.
4. USU Office of Research and Graduate Studies, "Two-Color Pyrometer for Our Existing Gleeble 1500D Thermo-Mechanical System," **\$15,394**, 06/01/19 – 05/31/20.
5. NSF Broadening Participation in Engineering, "Investigating the Career Development and Professional Trajectories of Disadvantaged Students in Engineering," **\$335,933**, 10/01/18 – 09/30/21.
6. AFRL/RQTI, "Damage Accumulation in a Novel High-Throughput Method to Measure High Cycle Fatigue," **\$19,845**, 09/01/18 – 08/31/19.
7. AFRL Summer Faculty Fellowship Program (SFFP), "Improved High-Throughput Measurements for High Cycle Fatigue at Extreme Temperatures" **\$43,500**, Summer 2018.
8. AFRL/RQTI, "Benchmark Simulations of Improved High-Throughput Method to Measure High Cycle Fatigue," **\$6,771**, 01/08/18 – 08/24/18.
9. NASA MSFC Cooperative Agreement Notice, "Heterogeneous Strain Measurement during Hot-Fire Testing of Carbon-Carbon Rocket Nozzles," **\$120,973**, 01/01/18 – 12/31/18.
10. AFRL Summer Faculty Fellowship Program (SFFP), "Characterizing Full-Field Vibration Fatigue at Elevated Temperatures," **\$37,125**, Summer 2017.
11. USU Office of Research and Graduate Studies, Proposal Writing Institute, **\$2,500**, May 2016.
12. USDOE Nuclear Energy University Program (NEUP), "Full Field Temperature and Strain Measurements at Extreme Temperatures," **\$226,824**, 01/01/16 – 12/31/16.
13. USU Office of Research and Graduate Studies, "Graduate Research Assistantship in Materials Characterization at Extreme Temperatures for Advanced Aerospace Applications," **\$80,000**, 08/01/15 – 03/31/19.
14. USU Office of Research and Graduate Studies, "High Temperature Vibrational Resonance of SiC Composites for Advanced Aerospace Applications," **\$20,000**, 07/01/15 – 12/31/16.

TOTAL PAST AND CURRENT AS PI: \$1,339,646.

Past and Current Support (administered as PI)

1. USDOE Nuclear Energy University Program (NEUP), "Transient Reactor (TREAT) Experiments to Validate MBM Fuel Performance Simulations," **\$5 Million**, 10/01/16 – 09/30/20.
⇒ This grant was awarded to Heng Ban as PI with me as a co-PI (see below). Heng remained the technical lead when he later moved to the University of Pittsburgh but the grant stayed with USU where I was asked to help administer it.
2. USDOE Nuclear Energy University Program (NEUP), "NEUP Fellowship and Scholarship Support," **\$1.325 Million**, 8/20/10 – 06/30/22.
⇒ These were collectively awarded to various undergraduate and graduate students, but I administer them by submitting annual reports.

Past and Current Support (as co-PI)

3. INL, "Full-Field Measurements of Heterogeneous Fuel Swelling to Validate Microstructural Models in MARMOT," **\$500,000 (my responsibility: about \$185,500)**, 3/1/19 - 8/31/20. (PI: Jason Schulthess)
4. USDOE Nuclear Energy University Program (NEUP), "Benchmarking Microscale Ductility Measurements," **\$776,669 (my responsibility: \$200,000)**, 10/01/18 – 09/30/21. (PI: Owen Kingstedt, University of Utah).
5. USDOE Nuclear Energy University Program (NEUP), "Focused Ion Beam for Advanced Specimen Preparation, 3D Microstructural Characterization, and Simulated Irradiation," **\$300,000**, 10/01/17 – 09/30/18. (PI: Nick Roberts).
6. USDOE Nuclear Energy University Program (NEUP), "Transient Reactor (TREAT) Experiments to Validate MBM Fuel Performance Simulations," **\$5 Million (my responsibility: about \$350,000)**, 10/01/16 – 09/30/20. (PI: Heng Ban).

7. Nuclear Regulatory Commission (NRC), "Faculty Development Program to Integrate New Faculty in Nuclear Engineering Research at Utah State University," **\$329,779 (my responsibility: about \$160,000)**, 08/31/15 – 08/30/18. (PI: Heng Ban).

TOTAL PAST AND CURRENT AS CO-PI: \$6,929,779 (my responsibility: about \$895,500)

Student Support (as Faculty Advisor)

1. USU Engineering Undergraduate Research Program (EURP), total of **\$63,000**:
 - a. Ashley Nielson, "Validating Scaling Relationships of Nuclear Materials," \$4500, 05/01/19 – 12/31/20 (Cohort #12).
 - b. Fiona Van Leeuwen, "Stereo DIC with Scheimpflug Adjustment," \$4500, 01/01/19 – 05/01/20 (Cohort #11).
 - c. Weston Craig, "Dynamic Interlaminar Fracture of 3D-Printed Materials," \$4500, 01/01/19 – 05/01/20 (Cohort #11).
 - d. Ben Hill, "Eliminating Strain Gauges in Vibration-based Fatigue Testing," \$4500, 01/01/19 – 05/01/20 (Cohort #11).
 - e. Matt Calvin, "Phase Locking to Improve Stereo DIC Resolutions in Full-Field Vibratory Measurements," \$4500, 01/01/19 – 05/01/20 (Cohort #11).
 - f. Katherine Burn, "DIC at Long Working Distances: The Effect of Diffraction Limits," \$4500, 05/01/18 – 12/31/19 (Cohort #10).
 - g. Samantha Burton, "High Throughput Vibration-based Measurements for High Cycle Fatigue," \$4500, 05/01/18 – 12/31/19 (Cohort #10).
 - h. Emma German, "Full-Field Deformation of Rotating Turbine Blades," \$4500, 01/01/18 – 05/01/19 (Cohort #9).
 - i. Daniel Waldram, "Super-Resolution Imaging for DIC at Improved Magnifications and Working Distances," \$4500, 01/01/18 – 05/01/19 (Cohort #9).
 - j. J. Jackson Matsen, "Damage Accumulation in Multi-Modal Vibration Fatigue," \$4500, 01/01/17 – 05/01/18 (Cohort #8).
 - k. Robert Rowley, "Full-Field Strain Measurements during High Temperature Impact," \$4500, 01/01/17 – 05/01/18 (Cohort #8).
 - l. Trevor J. Bird, "Modal Identification in Flat Plates during Vibrational Resonance at High Temperatures," \$4500, 01/01/16 – 05/01/17 (Cohort #7).
 - m. Ren Voie, "Full-Field Microstructural Strains at High Temperatures and Long Working Distances," \$4500, 01/01/16 – 05/01/17 (Cohort #7).
 - n. Jaren Devey, "UV Digital Image Correlation to characterize Graphite at Extreme Temperatures," \$4500, 01/01/15 – 05/01/16 (Cohort #6).
2. USDOE Nuclear Energy University Program (NEUP), "Graduate Fellowship for Adam Smith," **\$155,000**, 8/16/19 – 8/15/22.
3. USDOE Nuclear Energy University Program (NEUP), "Graduate Fellowship for Robert Hansen," **\$155,000**, 8/16/17 – 8/15/20.

TOTAL SUPPORT AS FACULTY ADVISOR: \$373,000.

BOOKS PUBLISHED (CONFERENCE PROCEEDINGS)

1. Jay Carroll, Shuman Xia, Allison M. Beese, **Ryan B. Berke**, Garrett J. Pataky (editors), "Fracture, Fatigue, Failure, and Damage Evolution," Volume 6, *Proceedings of the 2018 Annual Conference on Experimental and Applied Mechanics*. Greenville, SC. June 2018.
2. Jay Carroll, Shuman Xia, Allison M. Beese, **Ryan B. Berke**, Garrett J. Pataky (editors), "Fracture, Fatigue, Failure, and Damage Evolution," Volume 7, *Proceedings of the 2017 Annual Conference on Experimental and Applied Mechanics*. Indianapolis, IN. June 2017.
3. Alan T. Zehnder, Jay Carroll, Kavan Hazeli, **Ryan B. Berke**, Garrett Pataky, Matthew Cavalli, Allison M. Beese, Shuman Xia (editors), "Fracture, Fatigue, Failure, and Damage Evolution," Volume 8, *Proceedings of the 2016 Annual Conference on Experimental and Applied Mechanics*. Orlando, FL. June 2016.

JOURNAL PUBLICATIONS (SUBMITTED & PUBLISHED)¹

1. *T.Q. Thai, A.J. Smith, R.J. Rowley, P. Gradl, R.B. Berke*, "Change of Exposure Time Mid-Test in High Temperature DIC Measurement," To be submitted to *Measurement Science & Technology*. (pending release by NASA before we submit)
2. **R.B. Berke**, *B.A. Furman*, C.M. Holycross, O. Scott-Emuakpor, "Damage Accumulation in a Novel High-Throughput Technique to Characterize High Cycle Fatigue," *ASTM J. Test. Eval.* (submitted July 16, 2019).
3. *R.S. Hansen, T. Bird, R. Voie, K. Burn, R.B. Berke*, "A High Magnification UV Lens for High Temperature Optical Strain Measurements," *Review of Scientific Instruments*. (Accepted April 3, 2019).
4. *T.Q. Thai, R.S. Hansen, A.J. Smith, J. Lambros, R.B. Berke*, "The Importance of Exposure Time on DIC Measurement Uncertainty at Extreme Temperatures," *Experimental Techniques* **43**(3) pp. 261-271 (2019).
5. *E.K. Nickerson & R.B. Berke*, "Ultraviolet Diffraction-Assisted Image Correlation (UV-DAIC) for Single-Camera 3D Strain Measurement at Extreme Temperatures," *Experimental Mechanics*, **58**(6), pp. 885-892 (2018).
6. **R.B. Berke**, C.M. Sebastian, R. Chona, E.A. Patterson, & J. Lambros. "High Temperature Vibratory Response of Hastelloy-X: Stereo-DIC Measurements and Image Decomposition Analysis." *Experimental Mechanics* **56**(2), pp. 231-243 (2016)
7. **R.B. Berke** & M.E. Walter. "Using Specimen Geometry to Distinguish between Flexural and Torsional Modes when Determining Elastic Material Properties via Sonic Resonance." *ASTM J. Test Eval.* **44**(1) (2016).
8. **R.B. Berke** & J. Lambros. "Ultraviolet Digital Image Correlation (UV-DIC) for High Temperature Applications." *Rev. Sci. Inst.* **85**, 045121 (2014).
9. **R.B. Berke** & M.E. Walter. "Mesoscale Stress Response of Thin Ceramic Membranes with Honeycomb Support." *Int. J. Mech. Mater. Des.* **10**(1), pp. 53-64 (2014).
10. **R.B. Berke** & M.E. Walter, "Mechanical Characterization of Thin SOFC Electrolytes with Honeycomb Support." *J. Fuel Cell Sci. Technol.* **10**(1), pp. 1-7 (2013).

CONFERENCE PUBLICATIONS

1. *S.D. Burton, E.E. German, B.A. Furman, C.M. Holycross, O. Scott-Emuakpor, R.B. Berke*. "Improved Measurement for High-Cycle Fatigue Examination," *Proceedings of the SEM Annual Conference and Exposition*, Reno, NV June 2019.
2. *R.J. Rowley, C. Stolinski, W. Craig, O.T. Kingstedt, R.B. Berke*, "Dynamic Interlaminar Fracture of 3D-Printed ABS Plastic," Extended Abstract. *Proceedings of the SEM Annual Conference and Exposition*, Reno, NV June 2019.
3. **R.B. Berke**, C.M. Sebastian, A. Ding, R. Chona, E.A. Patterson, & J. Lambros. "Stereo-DIC Measurements of Thermal Gradient Effects on the Vibratory Response of Metals." *Proceedings of IMAC*, Orlando, FL. January 2016.
4. **R. B. Berke**, "Full-Field Strain Measurements at Extreme Temperatures using Ultraviolet Digital Image Correlation (UV-DIC)" Extended Abstract. *Proceedings of the Winter Meeting of the American Nuclear Society*, Washington D.C., Nov. 2015.
5. **R. B. Berke**, J. Lambros. "Ultraviolet Digital Image Correlation (UV-DIC) for Creep Measurement at High Temperatures" Extended Abstract. *Proceedings of the US National Congress on Theoretical and Applied Mechanics (USNCTAM)*, East Lansing, MI. June 2014.
6. **R. B. Berke**, C. M. Sebastian, E. A. Patterson, J. Lambros. "High Temperature Vibration Response of a Nickel-based Superalloy Validated Using stereo-DIC measurements." Extended Abstract. *Proceedings of the SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Greenville, SC. June 2014.
7. **R. B. Berke**, J. Lambros. "Ultraviolet Digital Image Correlation (UV-DIC) at High Temperatures" Extended Abstract. *Proceedings of the SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Greenville, SC. June 2014.
8. **R. Berke** & M. Walter, "Mechanical Characterization and Modeling of Corrugated Metal Foams for SOFC Applications." *Proceedings for ASME International Mechanical Engineering Congress & Exposition*, Denver, CO. Nov. 2011.

¹ Names in *italics* denote students advised by me. Names which are also underlined denote students who were undergraduates at the time that they made their contribution to the paper.

9. **R. Berke** & M. Walter. "Mechanical Characterization and Modeling of Solid Oxide Fuel Cells and Stacks." Proceedings for *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Mohegan Sun, Conn. June 2011.
10. **R. Berke**, A. Suresh, & M. Walter. "Mechanical Characterization and Modeling of Electrolyte Membranes in Electrolyte-Supported SOFCs." Proceedings for *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Indianapolis, Ind. June 2010.

INVITED / KEYNOTE PRESENTATIONS

1. **R.B. Berke**, "The Role of Camera Sensitivity in Extreme Temperature Optical Strain Measurements," University of California, Santa Barbara CA, May 2019.
2. **R.B. Berke**, "KEYNOTE: Ultraviolet Image-based Measurement Techniques for Strain Measurement at Extreme Temperatures," 2nd International Symposium on Image-based Metrology, Maui, HI, Dec. 2017.
3. **R.B. Berke**, "Heterogeneous Strain Measurements at Extreme Temperatures with Ultraviolet Digital Image Correlation (UV-DIC)," Lehigh University, Bethlehem, PA, Nov. 2017.
4. **R. B. Berke**. "Thermo-acoustic Response of Hastelloy X measured with Ultraviolet Digital Image Correlation (UV-DIC)," Oak Ridge National Lab, Oak Ridge, TN, Feb. 2016.
5. **R. B. Berke**. "Extreme Temperature Vibration Response of Hastelloy-X measured with Ultraviolet Digital Image Correlation (UV-DIC)," Army Research Lab, Aberdeen, MD, Nov. 2015.
6. **R. B. Berke**. "Vibration of Hastelloy-X at Extreme Temperatures measured with Ultraviolet Digital Image Correlation (UV-DIC)," National Institute of Standards and Technology (NIST), Gaithersburg, MD, Nov. 2015.
7. **R. B. Berke**. "Full-Field Temperature and Strain Measurements at Extreme Temperatures using Ultraviolet Digital Image Correlation," Idaho National Lab, August 2015.
8. **R. B. Berke**. "Mechanical Characterization at Extreme Temperatures using Ultraviolet Digital Image Correlation (UV-DIC)," Idaho National Lab, Materials and Fuels Complex, July 2015.
9. **R. B. Berke**. "Ultraviolet Digital Image Correlation (UV-DIC) for Mechanical Characterization at Extreme Temperatures," University of Utah, Salt Lake City, UT, April 2015.
10. **R. B. Berke**. "Materials Characterization at Extreme Temperatures using Digital Image Correlation," Missouri University of Science & Technology, Rolla, MO, August 2014.
11. **R. B. Berke**. "Materials Characterization at Extreme Temperatures using Digital Image Correlation," Utah State University, Logan, UT, August 2014.
12. **R. B. Berke**. "Mechanical Characterization of Solid Oxide Fuel Cell Electrolytes with Honeycomb Support," University of Illinois at Urbana-Champaign, Urbana, IL, October 2012.

CONFERENCE PRESENTATIONS

1. *T.Q. Thai, A.J. Smith, A. Dabb, R.B. Berke*, "How Alteration of Exposure Time Mid-Test affects UV-DIC at Extreme Temperatures," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
2. *R.S. Hansen, T.J. Bird, R. Voie, K. Burn, D. Waldram, R.B. Berke*, "High-Magnification In-Situ Optical Strain Measurements at Elevated Temperatures," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
3. *A.J. Smith, R.S. Hansen, T.Q. Thai, R.B. Berke*, "The Effect of Phase-Lag on Materials Undergoing Thermo-Mechanical Fatigue," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
4. *R.J. Rowley, C. Stolinski, W. Craig, O.T. Kingstedt, R.B. Berke*, "Dynamic Interlaminar Fracture of 3D-Printed ABS Plastic," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
5. *W. Craig, C. Stolinski, R.J. Rowley, O.T. Kingstedt, R.B. Berke*, "Interlaminar Crack Propagation in 3D-Printed Plastics with High Speed DIC," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
6. *B. Furman, R.B. Berke*, "Shape Optimization for Vibration-based Fatigue Specimens," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
7. *S.D. Burton, E.E. German, B.A. Furman, C.M. Holycross, O. Scott-Emuakpor, R.B. Berke*, "Improved High-Throughput Measurement of High Cycle Fatigue Examination," *SEM Annual Conference on Experimental and Applied Mechanics*, Reno, NV, June 2019.
8. Galliher, R. V., Parmenter, J. G., **Berke, R.**, *Craig, K.*, & *Cragun, H.* "Navigation of Career and Sexual/Gender Identity Development among LGBTQ+ College Students." *Biannual meeting of International Society for Research on Identity*. Naples, Italy, May 2019.

9. *R.S. Hansen, T.J. Bird, R. Voie, R.B. Berke*, "A Customized UV Lens for In-Situ Measurements at High Temperatures and High Magnifications," *ASME International Mechanical Engineering Congress & Exposition*, Pittsburgh, PA, Nov. 2018.
10. *T.Q. Thai, R.S. Hansen, A.J. Smith, P. Gradl, R.B. Berke*, "Effect of Exposure Time on Ultraviolet DIC at Extreme Temperatures," *ASME International Mechanical Engineering Congress & Exposition*, Pittsburgh, PA, Nov. 2018.
11. *R. B. Berke, M. E. Nelson, S. Burton*, "Full-Field Vibration Fatigue Strains at Extreme Temperatures," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, SC, June 2018.
12. *R. B. Berke, T. Thai, A. Dabb, A. Smith*, "Speckle Pattern Inversion in DIC at Extreme Temperatures," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, SC, June 2018.
13. *R. B. Berke, K. Burn, E. K. Nickerson*, "DIC at Long Working Distances: The Influence of Diffraction Limits," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, SC, June 2018.
14. *R. B. Berke, E. Nickerson*. "Ultraviolet Diffraction-Assisted Image Correlation (UV-DAIC) for Single-Camera Stereo-DIC at Extreme Temperatures," *ASME International Mechanical Engineering Congress & Exposition*, Tampa, FL, Nov. 2017.
15. *R. B. Berke, E. Nickerson*. "Single-Camera Stereo-DIC at Extreme Temperatures with Ultraviolet Diffraction-Assisted Image Correlation (UV-DAIC)," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Indianapolis, IN, June 2017.
16. *R. B. Berke, T. Thai, A. Ding, J. Lambros*. "Full-Field Strain Measurements up to 1700C with Ultraviolet Digital Image Correlation," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Indianapolis, IN, June 2017.
17. *R. B. Berke, T. Bird, S. Ames*. "Parametric Study of Resonating Plates at Extreme Temperatures," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Indianapolis, IN, June 2017.
18. *T. Bird, R. Berke*, "Resonant Response of Flat Plates at High Temperatures," USU Student Research Symposium, Logan, UT, April 2017.
 - a. First Place Undergraduate Engineering category
19. *R. B. Berke, E. Nickerson, T. Thai*. "Full-Field Thermal Strain Measurements on Graphite at Extreme Temperatures," *ASME International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, Nov. 2016.
20. *R. B. Berke, E. Nickerson, T. Thai*. "Measuring Full-Field Strains on Graphite in Extreme Temperatures using Ultraviolet Digital Image Correlation (UV-DIC)," *SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Orlando, FL, June 2016.
21. *R. B. Berke*. "Ultraviolet Digital Image Correlation (UV-DIC) for Measuring Full-Field Strains at Extreme Temperatures," *TMS Annual Conference*, Nashville, TN, Feb. 2016.
22. *R. B. Berke*. "Full-Field Strain Measurements at Extreme Temperatures using Ultraviolet Digital Image Correlation (UV-DIC)." *Winter Meeting of the American Nuclear Society*, Washington, D.C., Nov. 2015.
23. *R. B. Berke, J. Lambros*. "Ultraviolet Digital Image Correlation (UV-DIC) for Creep Measurement at High Temperatures." *US National Congress on Theoretical and Applied Mechanics (USNCTAM)*, East Lansing, MI. June 2014.
24. *R. B. Berke, C. M. Sebastian, E. A. Patterson, J. Lambros*. "High Temperature Vibration Response of a Nickel-based Superalloy Validated Using stereo-DIC measurements." *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Greenville, SC. June 2014.
25. *R. B. Berke, J. Lambros*. "Ultraviolet Digital Image Correlation (UV-DIC) at High Temperatures" *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Greenville, SC. June 2014.
26. *R. Berke, M. Walter, S. Monfort, G. Arkenberg*. "Mechanical Characterization and Modeling of Next-Generation Electrolyte-Supported SOFC Stacks." *ASME International Mechanical Engineering Congress & Exposition*, Houston, TX. Nov. 2012
27. *S. Akanda, M. Walter, R. Berke, N. Kidner, M. Seabaugh* "Lifetime Predictions of MCO Coatings on Metallic Interconnects." *ASME International Mechanical Engineering Congress & Exposition*, Houston, TX. Nov. 2012
28. *R. Berke, M. Walter*, "Mechanical Characterization and Modeling of Corrugated Metal Foams for SOFC Applications." *ASME International Mechanical Engineering Congress & Exposition*, Denver, CO. Nov. 2011

29. **R. Berke**, M. Walter, "Mechanical Characterization and Modeling of Next-Generation Solid Oxide Fuel Cells and Stacks." *Material Science & Technology 2011 Conference & Exposition*, Columbus, OH. Oct. 2011
30. **R. Berke**, M. Walter. "Mechanical Characterization and Modeling of Corrugated Metal Foams for SOFC Applications." *Department of Mechanical and Aerospace Engineering Graduate Student Research Day*, Columbus, OH. Oct. 2011.
31. M. Walter, B. Dev, & **R. Berke**. "Mechanical Characterization and Modeling of Solid Oxide Fuel Cells and Stacks." *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Mohegan Sun, Conn. June 2011.
32. **R. Berke**, B. Dev, & M. Walter. "Mechanical Characterization and Modeling of Solid Oxide Fuel Cells and Stacks." *ASME Applied Mechanics and Materials Conference (McMAT)*, Chicago, Ill. May 2011.
33. **R. Berke**, A. Suresh, & M. Walter. "Mechanical Characterization of Electrolyte-Supported Solid Oxide Fuel Cells." *Department of Mechanical and Aerospace Engineering Graduate Student Research Day*, Columbus, OH. Oct. 2010.
34. **R. Berke**, A. Suresh, & M. Walter. "Mechanical Characterization and Modeling of Electrolyte Membranes in Electrolyte-Supported SOFCs." *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Indianapolis, Ind. June 2010.
35. M. Walter, **R. Berke**, & A. Suresh. "Two-Scale Characterization and Modeling of Electrolytes in Electrolyte-Supported Solid Oxide Fuel Cells." *ASME International Mechanical Engineering Congress & Exposition*, Lake Buena Vista, Fla. Nov. 2009
36. **R. Berke**, A. Suresh, & M. Walter. "Two-Scale Modeling of Thin Layers in Electrolyte-Supported Planar Solid Oxide Fuel Cells." *U.S. National Congress on Computational Mechanics*, Columbus, Ohio. July 2009.

POSTER SESSIONS

1. *T.Q. Thai, A.J. Smith, R.S. Hansen, R.J. Rowley, R.B. Berke*, "Selection of Camera Sensitivity in High Temperature Optical Strain Measurements," *First Annual USU College of Engineering Poster Competition to celebrate Research Week*, Logan, UT, April 2019.
2. *E.E. German, R.B Berke*, "Relative Errors of Motion Blur vs Dept of Field in Image-based Vibration Measurements," 2018 Annual Meeting of Out in Science, Technology, Engineering and Mathematics, Houston, TX, Nov 2018.
3. *T. Bird, S. Ames, & R. Berke*. "Modal Identification in Flat Plates during Vibrational Resonance at High Temperatures," *ASME International Mechanical Engineering Congress & Exposition*, Phoenix, AZ, Nov. 2016.
4. *E. Nickerson, J. Schulthess, & R. Berke*. "Distortion Correction for Digital Image Correlation at HFEF." *Idaho National Laboratory's 2016 Intern Expo*, Aug. 2016.
 - a. World's Nuclear Energy Future poster competition, 2nd place
5. **R. Berke**, B. Dev, M. Walter, M. Jansen, M. Day, & S. Swartz. "Characterization of SOFC Electrolytes for Improved Mechanical Robustness." *Department of Mechanical and Aerospace Engineering Graduate Open House*, Columbus, OH. Feb. 2012.
6. **R. Berke**, M. Walter, "Mechanical Characterization and Modeling of Corrugated Metal Foams for SOFC Applications." *ASME International Mechanical Engineering Congress & Exposition*, Denver, CO. Nov. 2011
 - a. General Topics Poster Competition, 3rd place (of 95 participants)
 - b. NSF Student Poster Competition, Finalist
7. **R. Berke**, B. Dev, M. Walter, M. Jansen, M. Day, & S. Swartz. "Characterization of SOFC Electrolytes for Improved Mechanical Robustness." *Department of Mechanical and Aerospace Engineering Graduate Student Research Day*, Columbus, OH. Oct. 2011.
8. M. Walter, **R. Berke**, B. Dev, M. Jansen, M. Day, & S. Swartz. "Characterization of SOFC Electrolytes for Improved Mechanical Robustness." *12th Annual Solid State Energy Conversion Alliance Workshop*, Pittsburgh, PA. July 2011.
9. **R. Berke**, M. Walter, A. Suresh, P. Matter, M. Day, K. Chenault, & S. Swartz. "Mechanical Characterization and Modeling of Electrolyte Membranes in Electrolyte-Supported SOFCs." *Department of Mechanical and Aerospace Engineering Open House*, Columbus, OH. Feb. 2011.
10. **R. Berke**, M. Walter, A. Suresh, P. Matter, M. Day, K. Chenault, & S. Swartz. "Mechanical Characterization and Modeling of Electrolyte Membranes in Electrolyte-Supported SOFCs." *Department of Mechanical and Aerospace Engineering Graduate Student Research Day*, Columbus, OH. Oct. 2011.

11. M. Walter, A. Suresh, **R. Berke**, P. Matter, M. Day, K. Chenault, & S. Swartz. "Mechanical Characterization and Modeling of Electrolyte Membranes in Electrolyte-Supported SOFCs." *11th Annual Solid State Energy Conversion Alliance Workshop*, Pittsburgh, PA. July 2010.
12. **R. Berke**, M. Walter. "Application of Experimental Mechanics and Microstructural Analysis for Multi-Scale Materials Characterization." *Department of Mechanical Engineering Open House*, Columbus, OH. Feb. 2010.
13. **R. Berke**, T. Gatts, M. Walter. "Investigation of the Heating and Cooling of Composite Glass Seals for SOFCs." *Department of Mechanical Engineering Graduate Student Research Day*, Columbus, OH. Oct. 2010.
14. **R. Berke**, M. Walter. "Application of Experimental Mechanics and Microstructural Analysis for Multi-Scale Materials Characterization." *Department of Mechanical Engineering Open House*, Columbus, OH. Feb. 2009.
15. **R. Berke**, T. Gatts, M. Walter. "Investigation of the Heating and Cooling of Composite Glass Seals for SOFCs." *Department of Mechanical Engineering Graduate Student Research Day*, Columbus, OH. Oct. 2009.

TEACHING EXPERIENCE

As Assistant Professor at Utah State University:

MAE 3040: Mechanics of Solids (Junior Required Course)

- Fall 2019: ~170 students, no scores yet
- Fall 2018: 47 students, evaluation score 3.9/5.0
- Fall 2017: 53 students, evaluation score 4.2/5.0
- Fall 2016: 57 students, evaluation score 4.0/5.0
- Fall 2015: 47 students, evaluation score 3.6/5.0

MAE 5040: Experimental Solid Mechanics (Senior / Graduate Elective) – **New course** developed by me

- Fall 2019: 21 students, no scores yet
- Fall 2018: 23 students, evaluation score 4.3/5.0
- Fall 2017: 32 students, evaluation score 4.1/5.0
- Fall 2016: 6 students, evaluation score 4.4/5.0 (as MAE 5930: Special Topics)
- Spring 2015: 11 students, evaluation score 3.2/5.0 (as MAE 5930: Special Topics)

MAE 6060: Micro-Mechanics of Deformation (Graduate Elective) – **New course** developed by me

- Spring 2018: 8 students, evaluation score 4.6/5.0 (as MAE 6930: Special Topics)

MAE 6061: Micro-Mechanisms of Failure (Graduate Elective) – **New course** developed by me

- Spring 2019: 13 students, evaluation score 4.5/5.0 (as MAE 6930: Special Topics)

Prior to joining Utah State University:

ME 410: Statics (Sophomore Required Course), The Ohio State University (as Instructor of Record)

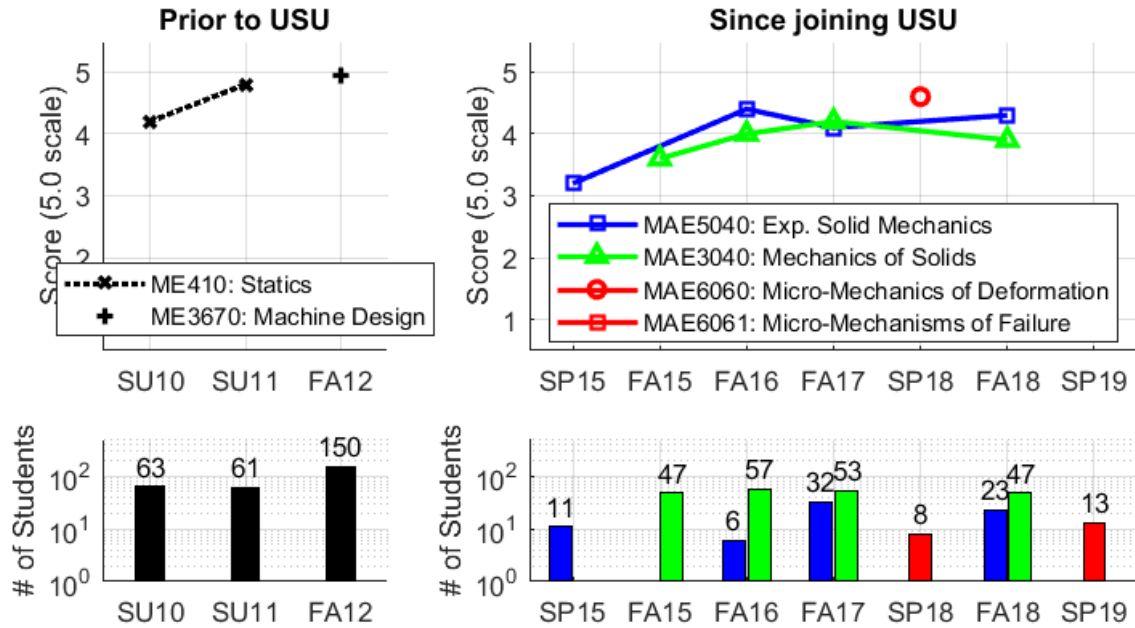
- Summer 2011: 61 students, evaluation score 4.8/5.0
- Summer 2010: 63 students, evaluation score 4.2/5.0

ME 3670: Machine Design (Junior Required Course), The Ohio State University (as Graduate TA)

- Fall 2012: 150 students, evaluation score 4.95/5.00

ENES 190H: Intro to Quality & Design (Sophomore Elective), Univ of Maryland (as Undergrad TA)

- Fall 2005: 70 students, no evaluation score



Other Teaching Activities:

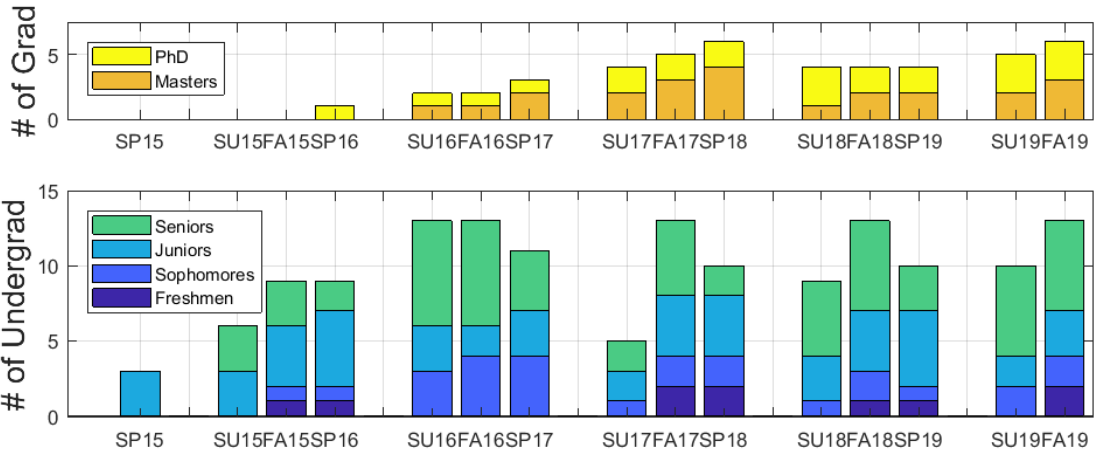
- Mentored a total of 11 graduate and 39 undergraduate researchers – including 17 women, 2 Latinas, 2 Native Americans, 1 veteran, and 5 LGBTQ+ students. *(Last Updated August 2019)*
 - o Fourteen (14) admitted into USU’s Engineering Undergraduate Research Program (EURP)
 - o Ten (10) admitted into USU’s Undergraduate Research Fellows (URF) Program
 - o One (1) recognized as the College of Engineering Undergraduate Researcher of the Year
 - Katharine Burn (2019)
 - o Two (2) recognized as MAE Undergraduate Researcher of the Year
 - Trevor Bird (2017), Katharine Burn (2019)
 - o Two (2) recognized as MAE MS Student Researcher of the Year
 - Ethan Nickerson (2018), Thinkh Thai (2019)
 - o One (1) recognized as MAE Outstanding Graduate Student of the Year
 - Chris Stolinski (2019)

- Advised eight (8) Undergraduate Teaching Fellows (UTFs) to develop new lab activities for MAE 5040: Experimental Solid Mechanics:
 - o Fall 2019: Out-of-Plane Bending / 3D-DIC (Emma German & Fiona Van Leeuwen)
 - o Fall 2018: Streamlining of existing labs: Kolsky bar instrumentation (Robert Rowley), freeware alternatives to 2D-DIC software (Weston Craig)
 - o Fall 2017: Dynamic Measurements (Robert Rowley) and Fracture Measurements (Weston Craig)
 - o Fall 2016: Vibration Measurements (Trevor Bird) and Strain Measurements (Robert Rowley)

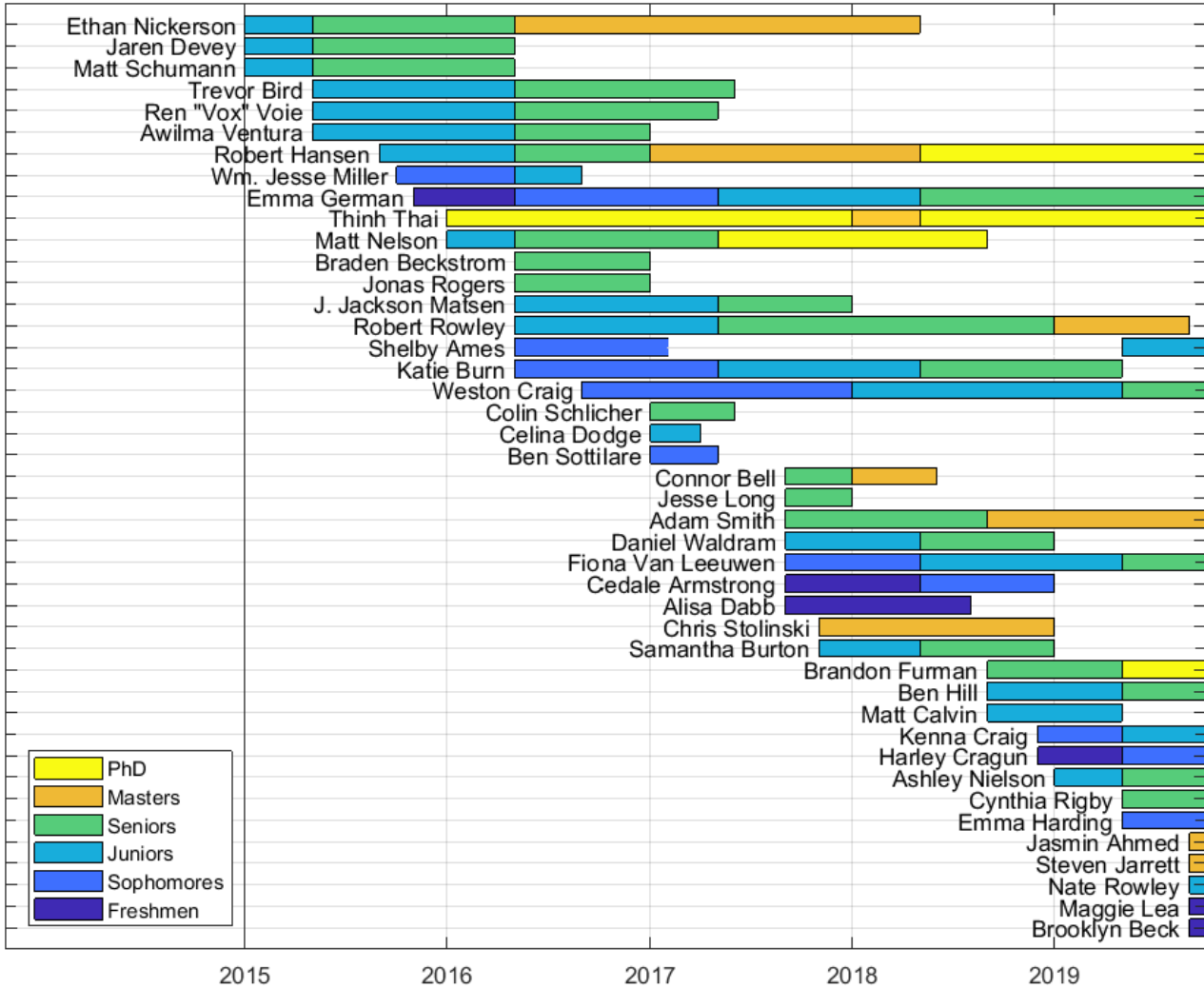
- Advised seven (7) Undergraduate Teaching Fellows (UTFs) to hold regular office hours and deliver guest lectures in MAE 3040:
 - o Fall 2019: Ben Hill and Brandon Ritchie
 - o Fall 2018: Brandon Furman
 - o Fall 2017: Adam Smith and Jesse Long
 - o Fall 2016: Matt Nelson and Braden Beckstrom

- Advised two (2) senior design teams to develop new lab instrumentation:
 - o 2018-19: UV Light Source for high speed & high depth of field imaging.
 - Kelsey Jacobs, Ryan Reid, & Travis Smith
 - o 2016-17: UV Zoom Lens for high temperature imaging.
 - Trevor Bird, Brian Grisenti, & Ren Voie

STUDENTS ADVISED



Timeline of Students Advised



PhD Students

1. Brandon Furman, PhD Student, May 2019-present
2. Robert Hansen, PhD Student, May 2018-present
3. Think Q. Thai, PhD Student, Jan 2016-present
4. Matt Nelson, PhD Student, May 2017-Aug 2018

MS Students

1. Steven Jarrett, M.S. Student, Aug 2019-present
2. Jasmin Ahmed, M.S. Student, Aug 2019-present
3. Adam Smith, M.S. Student, Aug 2018-present
4. Robert Rowley, M.S. Student, Jan 2019-Aug 2019
5. Chris Stolinski, M.S. Mechanical Engineering 2018
 - a. MAE Outstanding Graduate Student of the Year 2019
6. Connor Bell, M.S. Student, Jan-May 2018
7. Think Q. Thai, M.S. Mechanical Engineering 2018 → PhD in my lab
 - a. MAE M.S. Researcher of the Year 2019
8. Robert Hansen, M.S. Mechanical Engineering 2018 → PhD in my lab
9. Ethan Nickerson, M.S. Mechanical Engineering 2018
 - a. MAE M.S. Researcher of the Year 2018

Undergraduate Students

1. Brooklyn Beck, B.S. Mechanical Engineering (expected graduation May 2023)
2. Maggie Lea, B.S. Mechanical Engineering (expected graduation May 2023)
3. Nate Rowley, B.S. Mechanical Engineering (expected graduation May 2022)
4. Emma Harding, B.S. Mechanical Engineering (expected graduation May 2022)
5. Harley Cragun, B.S. Biological Engineering (expected graduation May 2022)
6. Kenna Craig, B.S. Statistics (expected graduation May 2021)
7. Fiona Van Leeuwen, B.S. Chemistry and Mechanical Engineering (expected graduation May 2021)
8. Cynthia Hammond, B.S. Mechanical Engineering (expected graduation May 2020)
9. Ashley Nielson, B.S. Mechanical Engineering (expected graduation May 2020)
10. Matthew Calvin, B.S. Mechanical Engineering (expected graduation May 2020)
11. Benjamin Hill, B.S. Mechanical Engineering (expected graduation May 2020)
12. Weston Craig, B.S. Mechanical Engineering (expected graduation May 2020)
13. Emma German, B.S. Mechanical Engineering (expected graduation May 2020)
14. Brandon Furman, B.S. Mechanical Engineering and Math 2019 → PhD in my lab
15. Katie Burn, B.S. Mechanical Engineering 2019
 - a. MAE Undergraduate Researcher of the Year 2019
 - b. College of Engineering Undergraduate Researcher of the Year 2019
16. Samantha Burton, B.S. Mechanical Engineering 2018 → MS at USU (not in my lab)
17. Daniel Waldram, B.S. Mechanical Engineering 2018
18. Robert Rowley, B.S. Mechanical Engineering 2018 → MS in my lab
19. Cedale Armstrong, Mechanical Engineering Student, 2017-2018
20. Alisa Dabb, Mechanical Engineering Student, 2017-2018
21. J. Jackson Matsen, B.S. Mechanical Engineering 2018 → MS at USU (not in my lab)
22. Adam Smith, B.S. Mechanical Engineering 2018 → MS & PhD in my lab
23. Connor Bell, B.S. Mechanical Engineering 2017 → MS at USU (not in my lab)
24. Jesse Long, B.S. Mechanical Engineering 2017
25. Matt Nelson, B.S. Mechanical Engineering 2017 → MS at USU (not in my lab)
26. Braden Beckstrom, B.S. Mechanical Engineering 2017 → MS at Colorado State
27. Trevor Bird, B.S. Mechanical Engineering 2017 → PhD at Purdue
 - a. MAE Undergraduate Researcher of the Year 2017
28. Jonas Rogers, B.S. Mechanical Engineering 2017 → MS at USU (not in my lab)
29. Ren "Vox" Voie, B.S. Mechanical Engineering 2017 → MS at Virginia Tech
30. Colin Schlicher, B.S. Mechanical Engineering 2017
31. Awilma Ventura, B.S. Mechanical Engineering 2017
32. Ben Sottolare, Mechanical Engineering Student, 2017
33. Celina Dodge, Mechanical Engineering Student, 2017
34. Shelby Ames, Mechanical Engineering Student, 2016-2017
35. Robert Hansen, B.S. Mechanical Engineering 2016 → MS & PhD in my lab
36. Wm. Jesse Miller, Mechanical Engineering Student, 2015-2016
37. Jaren Devey, B.S. Mechanical Engineering 2016 → MS at USU (not in my lab)
38. Ethan Nickerson, B.S. Mechanical Engineering 2016 → MS in my lab
39. Matt Schumann, B.S. Mechanical Engineering 2016

INTERNAL SERVICE ACTIVITIES

USU Committee Membership:

- USU Engineering Undergraduate Research Program (EURP) Committee *Fall 2016 – Present*
 - Committee Chair 2017-Present
- Undergraduate Research Advisory Board (URAB) *Aug 2019 – Present*
- MAE Faculty Search Committee *Aug 2019 – Present*
- MAE Faculty Search Committee *Aug 2018 – May 2019*
- MAE Faculty Search Committee *May 2016 – May 2017*
- MAE Undergraduate Studies Committee *Fall 2015 – Summer 2016*

Advisor for Student Organizations:

- Student Chapter for oSTEM (Faculty Advisor) *Spring 2017 – Present*
- Student Chapter of the American Nuclear Society (Faculty Advisor) *Fall 2017 – Fall 2018*

Participant:

- SWE Engineering Extravaganza *March 2019*
- USU Engineering State Summer Camp *Summer 2018-2019*
- USU Native American STEM Mentorship Program (NASMP) *Summer 2016-2018*
- USU Allies on Campus *Spring 2016 – Present*
- USU Interfaith Initiative *Spring 2016 – Present*

EXTERNAL SERVICE ACTIVITIES

Society for Experimental Mechanics (SEM) *Spring 2010 – Present*

Fracture and Fatigue Technical Division

Secretary June 2018-Present

Abstract Chair and Editor June 2017-2018

Abstract Reviewer June 2015-2018

Education Committee, Member June 2017-Present

Secretary June 2019-Present

Research Committee, Member June 2017-Present

2019 SEM Annual Conference, Reno, NV

1. Workshop Co-Organizer: "Let's Talk Post-Doc" (with Meg Grady)
2. Panel Organizer: "Panel on Junior Career Development in Academia"
3. Session Organizer: "Fracture and Fatigue in Extreme Environments" (with Kavan Hazeli)
4. Session Organizer: "Vibration Methods and High Cycle Fatigue" (with Onome Scott-Emuakpor)

2018 SEM Annual Conference, Greenville, SC

1. Chair of the Abstract Review Committee for Fracture and Fatigue Technical Division
2. Session Organizer: "In-situ Techniques for Fracture and Fatigue" (with Garrett Pataky)
3. Session Organizer: "Fracture and Fatigue in Extreme Environments" (with Kavan Hazeli)
4. Session Organizer: "Vibration Effects in Fracture and Fatigue" (with Onome Scott-Emuakpor)

2017 SEM Annual Conference, Indianapolis, IN

1. Paper Reviewer for Fracture and Fatigue Sessions (with Garrett Pataky)
2. Session Organizer: "In-situ Techniques for Fracture and Fatigue" (with Omer Ozgur Capraz)
3. Session Organizer: "Fracture and Fatigue in Extreme Environments" (with Kavan Hazeli)
4. Session Organizer: "Vibration Effects in Fracture and Fatigue" (with Onome Scott-Emuakpor)
5. Session Organizer: "Brittle Fracture" (with Garrett Pataky)

2016 SEM Annual Conference, Orlando, FL

1. Paper Reviewer for Fracture and Fatigue Sessions (with Garrett Pataky)
2. Session Organizer: "In-situ Techniques for Fracture and Fatigue" (with Allison Beese and Garrett Pataky)
3. Session Organizer: "Fracture and Fatigue in Extreme Environments" (with Kavan Hazeli)
4. Session Organizer: "General Topics in Fracture and Fatigue" (with Garrett Pataky)
5. Session Organizer: "Damage Detection in Fracture and Fatigue" (with Shuman Xia and Xueju Wang)
6. Session Co-chair: "Interfacial Effects in Fracture and Fatigue" (with Vikas Tomar and Garrett Pataky)

American Society of Mechanical Engineers (ASME) *Fall 2003 – Present*
 Applied Mechanics Division > Experimental Mechanics Committee

Chair Nov. 2018-present
Vice Chair Nov. 2016-2018

2019 IMECE Annual Conference, Salt Lake City, UT

1. Topic Organizer: "11-13: Quantitative Visualization of Fracture and Failure" (with Natasha Vermaak)
2. Topic Organizer: "11-15: Mechanical Characterization in Extreme Temperature Environments" (with Natasha Vermaak and Owen Kingstedt)
3. Topic Organizer: "11-18: In Situ Techniques in Experimental Mechanics" (with Leslie Lamberson and Owen Kingstedt)
 - a. Cross-listed as session 10-1 (co-sponsored with Advanced Materials division)

2018 IMECE Annual Conference, Pittsburgh, PA

1. Topic Organizer: "12-3: Mechanical Characterization in Extreme Temperature Environments" (with Natasha Vermaak and Owen Kingstedt)
2. Topic Organizer: "12-5: Quantitative Visualization of Fracture and Failure" (with Leslie Lamberson and Natasha Vermaak)
3. Topic Organizer: "12-6: In Situ Techniques in Experimental Mechanics" (with Charles Wojnar)

2017 IMECE Annual Conference, Tampa, FL

1. Topic Organizer: "12-12: Quantitative Visualization of Fracture and Failure" (with Leslie Lamberson and Natasha Vermaak)
2. Topic Organizer: "12-13: In Situ Techniques in Experimental Mechanics of Fracture and Failure" (with Charles Wojnar)
3. Topic Organizer: "12-23: Mechanical Characterization in Extreme Temperature Environments" (with Natasha Vermaak)

2016 IMECE Annual Conference, Phoenix, AZ

1. Topic Organizer: "12-31: Mechanical Characterization in Extreme Temperature Environments" (with Natasha Vermaak)

American Nuclear Society (ANS), Materials Science and Technology Division Winter 2015 – Present

Proposal reviewer for DOE Consolidated Innovative Nuclear Research (CINR) FY 2015 – Present

Proposal reviewer for NSF Mechanics of Materials and Structures (MOMS) Winter 2017 – Present

Journal reviewer for *Experimental Mechanics*, *I.J. Mechanics and Materials in Design*, *J. Applied Mechanics*, *J. Strain Analysis in Engineering Design*, *J. Testing & Evaluation*, *Materials Research Express*, *Measurement Science and Technology*, *Mechanics of Materials*, *Nuclear Technology*, and *Review of Scientific Instruments*. 2015 – Present

Prior to joining Utah State University:

American Society for Engineering Education (ASEE) Spring 2010 – Spring 2013

Student Chapter President, 2010-'11 & 2011-'12 Academic Years (Reelected)

Ohio State Mechanical Engineering Grad Student Association (MEGA) Fall 2008 – Fall 2012

Chapter President, 2011-'12 Academic Year

Ohio State Mechanical Engineering Graduate Studies Committee

Student Representative

Fall 2011 – Fall 2012

Ohio State Design & Manufacturing Interest Group Committee

Student Representative

Fall 2012