

Patrick J. Shamberger

I. EDUCATION

<u>Institution</u>	<u>Major</u>	<u>Degree, Year</u>
University of Washington, Seattle, WA.	Materials Science and Eng.	Ph.D., 2010
University of Hawai'i–Manoa, Honolulu, HI.	Geology & Geophysics	M.S., 2004
Princeton University, Princeton, NJ.	Civil & Environmental Eng.	B.S., 2002
	Geological Eng.	<i>Magna cum laude</i> , with High Departmental Honors Certificate, 2002

II. PROFESSIONAL APPOINTMENTS

2021 to present	Associate Professor, <i>Materials Science & Engineering Dept.</i> , Texas A&M Univ., College Station, TX
2015 to present	Undergraduate Degree Program Director, <i>Materials Science & Engineering Dept.</i> , Texas A&M Univ., College Station, TX
2015 to 2021	Assistant Professor, <i>Materials Science & Engineering Dept.</i> , Texas A&M Univ., College Station, TX
2014 to 2015	Research Assistant Professor, <i>Materials Science & Engineering Dept.</i> , Texas A&M Univ., College Station, TX
2012 to 2013	Materials Research Engineer / Oxide Electronics Thrust Lead, <i>Nanoelectronic Materials Branch, Air Force Research Laboratory (WPAFB)</i>
2010 to 2012	Materials Research Engineer / Thermal Storage Tech Lead, <i>Thermals Sciences and Materials Branch, Air Force Research Laboratory (WPAFB)</i>

III. NOTABLE HONORS & AWARDS

- NSF CAREER Award, NSF:DMR/MMN (2019)
- Montague-Center for Teaching Excellence Scholar, TAMU (2018)
- College of Engineering Excellence in Teaching Award, College of Engineering, TAMU (2018)
- New Materials Educator Award, Materials Division, ASEE (2017)
- Emerging Investigator Award, Materials Research Express, IOP (2016)
- Open Education Champion Award, Student Government Association, TAMU (2016)
- SMART Fellowship, Dept. of Defense / ASEE (2009-2010)
- NDSEG Fellowship, Dept. of Defense / ASEE (2006-2009)

IV. OTHER RECOGNITIONS & AWARDS

- Engineering Genesis Award (Next Generation Materials and Manufacturing), Texas A&M Engineering
Experiment Station (2020)
- Engineering Genesis Award (Salt Hydrate Eutectic Thermal Energy Storage for Building Thermal
Regulation), Texas A&M Engineering Experiment Station (2020)
- NAE Frontiers of Engineering Education Symposium selectee, NAE (2015)
- Outstanding Senior Graduate Student Lecture, Materials Science Dept., UW (2010)
- National School on Neutron and X-ray Scattering, Oak Ridge Nat. Lab, Argonne Nat. Lab (2009)
- UWWW IGERT Affiliate, Materials Science Dept., UW (2006-2007)

- GSFEI Top Scholar Award, Graduate School, UW (2005)
- Nanotech Earlybird Fellowship, Center for Nanotechnology, UW (2005)
- Outstanding Master's Student in Research Award, Chancellor's office, Univ. of Hawai'i–Manoa (2004)
- National Weather Service Fellowship, Geology & Geophysics Dept., Univ. of Hawai'i–Manoa (2002-2004)
- W. Taylor Thom Jr. Prize for excellence in geological engineering, Princeton University (2002)
- Arthur F. Buddington Award for overall excellence, Geosciences Dept., Princeton University (2002)
- William E. Bonini Award for Teaching, Princeton University (2002)
- Sigma Xi, Princeton University (2002)
- Tau Beta Pi, Princeton University (2002)

V. STUDENT AWARDS AND RECOGNITIONS

- Best Oral Presentation Award, Alison Hoe*, Texas A&M Univ., Conference on Energy (2021)
- First Place Student Speaking Symposium (S3), Mason Shoalmire#, ASM International (2021)
- Craig Brown Outstanding Senior Engineer Award, Andrew Balog#, Texas A&M Univ. (2020)
- GEM Fellowship, Robert Mach*. (2020)
- Graduate Research Fellowship Program (GRFP), Rebeca Gurrola*, NSF. (2020-2023)
- TAMU OGAPS Diversity Fellowship, Rebeca Gurrola*, TAMU OGAPS (2019-2021)
- D³EM Fellow, Adelaide Bradicich*, NSF/Texas A&M Univ. (2019)
- D³EM Fellow, Aliya Yano*, NSF/Texas A&M Univ. (2019)
- D³EM Fellow, Alison Hoe*, NSF/Texas A&M Univ. (2018)
- TAMU OGAPS Diversity Fellowship, Adelaide Bradicich*, TAMU OGAPS (2018-2019)
- Craig Brown Outstanding Senior Engineer Award, Willie Caraway#, Texas A&M Univ. (2017)
- Clare Boothe Luce Fellowship Program, Julia Billman#, Texas A&M Univ. (2017-2020)
- Graduate Research Fellowship Program (GRFP), Tim Brown*, NSF (2016-2019)
- TAMU COE Merit Fellowship, Tim Brown*, TAMU College of Engineering (2014-2016)
- Craig Brown Outstanding Senior Engineer Award, Tyler Buffington#, Texas A&M Univ. (2016)
- K.R. Ramamani Undergraduate Thesis Award, Tyler Buffington#, Texas A&M Univ. (2016)
- Best Session Presentation award, Joshua Murley#, Gulf Coast Undergraduate Research Symposium (2014)

* Graduate Students, # Undergraduate Students

VI. PATENTS

1. **P.J. Shamberger**, “Nucleating Agent for Lithium Nitrate Trihydrate Thermal Energy Storage Medium.” U.S. Patent 8,703,258, issued April 22, 2014.
2. H. Toliyat et al., “High Torque Density Electric machine with Directly Cooled End Windings.” U.S. Patent Application. Docket No. 13260-P215V1.

VII. REFEREED PUBLICATIONS

(see: <http://scholar.google.com/citations?user=T5wU3pAAAAAJ> . Citations: 1880, h-index: 20, i10-index: 32).

IN PRESS

- RR. S.N. Lak, S. Ahmed*, **P.J. Shamberger**, E.B. Pentzer. Encapsulation of Hygroscopic Liquids via Polymer Precipitation in Non-aqueous Emulsions, *in press, J Colloid Interface Sci.* doi: 10.1016/j.jcis.2022.08.083
- RR. A. Chakraborty, **P.J. Shamberger**, C. Yu. In-Operando Crystallization Study of Zinc Nitrate Hexahydrate Using Zinc Oxide Nucleators, *in press, J Energy Storage.* doi: <https://doi.org/10.1002/est2.372>
- RR. A. Hoe*, J. Felts, **P.J. Shamberger**. Numerical Evaluation of Thermal Energy Storage Rate in Planar and Cylindrical Phase Change Material Composites, *in press, J Energy Storage.* doi: [https://doi.org/10.1002/est ...](https://doi.org/10.1002/est...)

2023

64. M. Deckard*, D. Sharar, M. Fish, **P.J. Shamberger**, Phase Change Material Behavior in Finite Thickness Slabs Under a Step Response Heat. *ASME J. Electron. Packag.*, **145**(1), 011201 (2023) doi: 10.1115/1.4054651

2022

63. A. Chakraborty, J. Noh, R. Mach*, **P.J. Shamberger**, C. Yu. Thermal Energy Storage Composites with Preformed Expanded Graphite Matrix and Paraffin Wax for Long-term Cycling Stability and Tailored Thermal Properties, *J Energy Storage*, **52**, 104856 (2022). doi: 10.1016/j.est.2022.104856
62. P. Schofield, E.J. Braham, B. Zhang, J.L. Andrews, H. Drozdick, D. Zhao, W. Zaheer, R. Gurrola*, K. Xie, **P.J. Shamberger**, X. Qian, S. Banerjee, Decoupling the Metal—Insulator Transition Temperature and Hysteresis of VO₂, *Chem. Commun.*, **58**, 6586-6589 (2022). doi: 10.1039/d2cc01599d
61. S. Ahmed*, A. Hoe*, F. Alamo*, N. Turner*, **P.J. Shamberger**. Experimental Determination of High Energy Density Lithium Nitrate Hydrate Eutectics, *J Energy Storage*, **52**, 104754 (2022). doi: 10.1016/j.est.2022.104754
60. M. Shanks, C.M. Shoalmire*, M. Deckard*, K. Gohil, H. Lewis II, D. Lin, **P.J. Shamberger**, N. Jain, Design of Spatial Variability in Thermal Energy Storage Modules for Enhanced Power Density Applied Energy, *Applied Energy*, **314**, 118966 (2022). doi: 10.1016/j.apenergy.2022.118966
59. A. Hoe*, M.T. Barako, A. Tamraparni, C. Zhang, A. Elwany, J. Felts, **P.J. Shamberger**. Objective Oriented Phase Change Material Composite Heat Sink Design, *Applied Thermal Eng.*, **209**, 118235 (2022). doi: 10.1016/j.applthermaleng.2022.118235

2021

58. A. Bradicich*, H. Clarke*, E.J. Braham, A. Yano*, D. Sellers, Sarbajit Banerjee, **P.J. Shamberger**. Probing Relaxation Dynamics and Stepped Domain Switching in Boron-Alloyed VO₂, *Advanced Electronic Materials*, **8**(3), 2100932 (2021). doi: 10.1002/aelm.202100932.
57. K. Rajagopalan, P. Karimineghlani, X. Zhu, **P.J. Shamberger**, and S.A. Sukhishvili, Polymers in Molten Inorganic Salt Hydrates: Solubility and Gelation, *J Mater. Chem, A*, **9**, 25892 (2021). doi: 10.1039/D1TA07842A.
56. S. Chakravarty*, D.J. Sharar, **P.J. Shamberger**. Heterogeneous Nucleation of Gallium with Lattice-Matched Cubic Carbide and Nitride Phases, *J. Appl. Phys*, **130**, 125107 (2021). doi: 10.1063/5.0060207.
55. C.T. Long, R. Wang, C. Shoalmire*, D. Antao, **P.J. Shamberger**, J.C. Grunlan, Heat Shielding of Steel with Polymer-Clay Multilayer Thin Films, *ACS Appl. Mater. Interfaces*, **13**(16), 19369-19376 (2021). doi: 10.1021/acsaami.1c03781

54. [Y. Zhang*](#), [C. Lago*](#), I. Karaman, [P.J. Shamberger](#). Nucleation site potency distributions in thermoelastic martensitic transformation in Ni₄₃Co₇Mn₃₉Sn₁₁ particles, *Phys. Rev. Mater.*, **5**(2), 023401 (2021). doi: 10.1103/PhysRevMaterials.5.023401
53. A. Ali, [P.J. Shamberger](#), S. Vaddiraju. Thermal Conductivity of Mg₂Si_{1-x}Sn_x Nanowire Assemblies Synthesized using Solid-State Phase Transformation of Silicon Nanowires, *Mater. Res. Express.*, **8**(2), 025005 (2021). doi: 10.1088/2053-1591/abdf80
52. C. Zhang, A. Banerjee, [A. Hoe*](#), A. Tamraparni, J. Felts, [P.J. Shamberger](#), A. Elwany. Design for laser powder bed additive manufacturing of AlSi12 periodic mesoscale lattice structures, *Int. J. Adv. Manuf. Technol.* (2021). doi: 10.1007/s00170-021-06817-w

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51. A. Tamraparni, [A. Hoe*](#), [M. Deckard*](#), C. Zhang, [P.J. Shamberger](#), A. Elwany, J. Felts. Design and optimization of lamellar phase change composites for thermal energy storage, *Adv. Eng. Mtls.*, 2001052 (2020). doi: 10.1002/adem.202001052.
50. [A. Yano*](#), [H. Clarke*](#), D. Sellers, E.J. Braham, T.E.G. Alivio, S. Banerjee, [P.J. Shamberger](#). Towards High-Precision Control of Transformation Characteristics in VO₂ through Dopant Modulation of Hysteresis, *J. Phys. Chem. C.*, **124**(39), 21223-21231 (2020). doi: 10.1021/acs.jpcc.0c04952.
49. [P.J. Shamberger](#), [A. Hoe*](#), [M. Deckard*](#), M. T. Barako. Dynamics of Melting in a Slab under Harmonic Heating and Convective Cooling Boundary Conditions, *J. Appl. Phys.*, **128**, 105102 (2020). doi: 10.1063/5.0016060.
48. D. Sellers, E. Braham, R. Villarreal, B. Zhang, A. Parija, [T.D. Brown*](#), T. Alivio, [H. Clarke*](#), L. De Jesus, L. Zuin, D. Prendergast, X. Qian, R. Arróyave, [P.J. Shamberger](#), S. Banerjee. An Atomic Hourglass and Thermometer Based on Diffusion of a Mobile Dopant in VO₂, *J. Am. Chem. Soc.*, **142**(36), 15513-15526 (2020). doi: 10.1021/jacs.0c07152
47. H.P. de Bock, D. Huitink, [P.J. Shamberger](#), J.S. Lundh, S. Choi, N. Niedbalski, L. Boteler. A System to Package Perspective on Transient Thermal Management of Power Electronics, *ASME J Electronics Packaging*. **142**(4), 041111-1-11 (2020). doi: 10.1115/1.4047474
46. A. Tamraparni, [P.J. Shamberger](#), J. Felts. Cyclic Stability of Lithium Nitrate Trihydrate in Plate Fin Heat Exchangers, *Appl. Therm. Eng.* **179**, 115476 (2020). doi: 10.1016/j.applthermaleng.2020.115476
45. [A. Hoe*](#), [M. Deckard*](#), A. Tamraparni, A. Elwany, J. Felts, [P.J. Shamberger](#). Conductive Heat Transfer in Lamellar Phase Change Material Composites, *Appl. Therm. Eng.* **178**, 115553 (2020). doi: 10.1016/j.applthermaleng.2020.115553
44. [T.D. Brown*](#), J.-H. Chen, E.J. Braham, S. Stadler, [P.J. Shamberger](#). Dynamic Re-equilibration Controlled Multi-step Transformations in (Mn,Fe)₂(P,Si) Alloys, *J. Phys. D: Appl. Phys.* **53**(20), 205303 (2020). doi: 10.1088/1361-6463/ab768a
43. [T.D. Brown*](#), [D. Galvan#](#), [J. van Buskirk#](#), A. Mott, [P.J. Shamberger](#). Effect of Carbide Formation on Phase Equilibria and Compositional Modulation of Transformation Properties in (Mn,Fe)₂(P,Si) Alloys, *J. Alloys Compounds*, **830**, 154532 (2020). doi: 10.1016/j.jallcom.2020.154532.
42. [P.J. Shamberger](#), N. Bruno. Review of Metallic Phase Change Materials for High Heat Flux Transient Thermal Management Applications, *Applied Energy*, **258**, 113955 (2020). doi: 10.1016/j.apenergy.2019.113955
41. [H. Clarke*](#), [L. Deremo#](#), [J. Anderson#](#), S. Ganguli, [P.J. Shamberger](#). Conductive Filament Shape in HfO₂ Electrochemical Metallization Cells Under a Range of Forming Voltages, *Nanotechnology*, **55**(7), 075706 (2020). doi: 10.1088/1361-6528/ab53a9

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40. Q. Li, C. Hu, [H. Clarke*](#), M. Li, [P.J. Shamberger](#), W. Wu, J. Yuan. Microstructure Defines the Electroconductive and Mechanical Performance of Plant-derived Renewable Carbon Fiber, *Chemical Communications*, **55**, 12655-12658 (2019). doi: 10.1039/c9cc05016g
39. [Y. Zhang*](#), [J. Billman#](#), [P.J. Shamberger](#). Size Effects in Hysteresis of Electrochemically Deposited Ni-Mn-Sn Heusler Alloy Films, *Acta Materialia*, **180**, 116-135 (2019). doi: 10.1016/j.actamat.2019.09.001
38. K. Yazawa, [P.J. Shamberger](#), T. Fisher. Ragone Relations for Thermal Energy Storage Technologies, *Frontiers in Mech. Eng.*, **5**, 29 (2019). doi: 10.3389/fmech.2019.00029

2018

37. [E. Emmons*](#), [P.J. Shamberger](#). Corrosive Effect of Lithium Nitrate Trihydrate on Common Heat Exchanger Materials, *Materials and Corrosion*, 1-11 (2018). doi: 10.1002/maco.201810557
36. [Clarke, H.*](#), [B. Carraway#](#), D. Sellers, E. Braham, S. Banerjee, R. Arróyave, [P.J. Shamberger](#). Nucleation-controlled hysteresis in unstrained hydrothermal VO₂ particles, *Phys. Rev. Materials*, **2**, 103402 (2018). doi: 10.1103/PhysRevMaterials.2.103402
35. [Zhang, Y.*](#), [P.J. Shamberger](#). Thick Film Ni_{0.5}Mn_{0.5-x}Sn_x Heusler Alloys by Multi-layer Electrochemical Deposition, *Scientific Reports*, **8**, 11931 (2018). doi: 10.1038/s41598-018-29628-8
34. [Brown, T.D.*](#), [T. Buffington#](#), [P.J. Shamberger](#). Effects of Hysteresis and Brayton Cycle Constraints on Magnetocaloric Refrigerant Performance, *J. Appl. Phys.*, **123**(18), 185101 (2018). doi: 10.1063/1.5022467
33. Braham, E., D. Sellers, [E. Emmons*](#), R. Villarreal, H. Asayesh-Ardakani, N. Flear, K. Farley, R. Shahbazian-Yassar, R. Arróyave, [P.J. Shamberger](#), S. Banerjee. Modulating the Hysteresis of an Electronic Transition: Launching Alternative Transformation Pathways in the Metal—Insulator Transition of Vanadium(IV) Oxide, *Chemistry of Material*, **30**(1), 214-224 (2018). doi: 10.1021/acs.chemmater.7b04203
32. [Shamberger, P.J.](#), T. Fisher. Cooling Power and Characteristic Times of Composite Heatsinks and Insulants, *Int. J. Heat Mass Transfer*, **117**, 1205-1215 (2018). doi: 10.1016/j.ijheatmasstransfer.2017.10.085

2017

31. Andrews, J.L., S. Singh, C. Kilcoyne, P.M. Marley, [P.J. Shamberger](#), G. Sambandamurthy, S. Banerjee. Memristive response of a new class of hydrated vanadium oxide intercalation compounds, *MRS Comm.*, **7**(3), 634-641 (2017). doi: 10.1557/mrc.2017.64
30. [Shamberger, P.J.](#), [Y. Mizuno#](#), A. Talapatra. Mixing and Electronic Entropy Contributions to Thermal Energy Storage in Low Melting Point Alloys, *J. Appl. Phys.*, **122**(2), 025105 (2017). doi: 10.1063/1.4990984
29. Karimineghlani, P., [E. Emmons*](#), M. Green, [P.J. Shamberger](#), and S. Sukhishvili. A Temperature-Responsive Polymer Matrix for Controlling Fluidity of an Inorganic Phase Change Material, *J. Mater. Chem. A*, **5**, 12474-12482 (2017). doi: 10.1039/C7TA02897K
28. Alivio, T.E.G., D. Sellers, H. Asayesh-Ardakani, E. Braham, G. Horrocks, K. Pelcher, R. Villarreal, L. Zuin, [P.J. Shamberger](#), R. Arróyave, R. Shahbazian-Yassar, S. Banerjee. A Post-Synthetic Route for Modifying the Metal—Insulator Transition of VO₂ by Interstitial Dopant Incorporation, *Materials Chemistry*, **29**(12), 5401-5412 (2017). doi: 10.1021/acs.chemmater.7b02029

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27. [Clarke, H.*](#), [T. Brown*](#), J. Hu, R. Ganguli, A. Reed, A. Voevodin, **P.J. Shamberger**. Microstructure Dependent Filament Forming Kinetics in HfO₂ Programmable Metallization Cells, *Nanotechnology*, **27**(42), 425709 (2016). doi: 10.1088/0957-4484/27/42/425709
26. [Brown, T.D.*](#), I. Karaman, **P.J. Shamberger**. Impact of cycle-hysteresis interactions on the performance of giant magnetocaloric effect refrigerants, *Materials Research Express*, **3**, 074001 (2016). doi: 10.1088/2053-1591/3/7/074001 ****Emerging Investigators special edition****
25. **Shamberger, P.J.**. J.L. Wohlwend, A.J. Roy, A.A. Voevodin. Investigating Grain Boundary Structures and Energetics of Rutile with Reactive Molecular Dynamics, *J. Phys. Chem. C*, **120**(24). 13049-13062 (2016). doi: 10.1021/acs.jpcc.6b02695
24. **Shamberger, P.J.**. Cooling Capacity Figure of Merit for Phase Change Materials, *J. of Heat Transfer*, **138**(2), 024502 1-7 (2016). doi: 10.1115/1.4031252

2015

23. Zhou, Y., [E. Jung^x](#), R. Arróyave, M. Radovic, **P.J. Shamberger**. Incorporating Research Experiences into an Introductory Materials Science Course, *Int. J. Eng. Educ.*, **31**(6A), 1491–1503 (2015).
22. [Brown, T.D.*](#), N. M. Bruno, J. Chen, I. Karaman, J. Ross, **P.J. Shamberger**. A Preisach-Based Nonequilibrium Methodology for Simulating Performance of Hysteretic Magnetic Refrigeration Cycles, *JOM*, **67**(9), 2123-2132 (2015). doi: 10.1007/s11837-015-1519-0
21. [Reed, A.*](#), **P.J. Shamberger**, C. Muratore, J.E. Bultman, J.J. Hu, A. A. Voevodin. Microstructure of ZnO Thin Films Deposited by HiPIMS, *Thin Solid Films*, **579**, 30-37 (2015). doi: 10.1016/j.tsf.2015.02.048
20. **Shamberger, P.J.**, M. O'Malley. Heterogeneous Nucleation of Thermal Storage Material LiNO₃·3H₂O from Stable Lattice-Matched Nucleation Catalysts, *Acta Materialia*, **84**, 265-274 (2015). doi: 10.1016/j.actamat.2014.10.051

2014

19. Muratore, C., J.J. Hu, M. A. Haque, J.E. Bultman, M.L. Jespersion, **P.J. Shamberger**, A. A. Voevodin. Continuous ultra-thin MoS₂ films grown by low-temperature physical vapor deposition, *Appl. Phys. Lett.*, **104**, 261604 (2014). doi: 10.1063/1.4885391

2011-2013 (AFRL)

18. Muratore, C., V. Varshney, J.J. Gengler, J.J. Hu, J.E. Bultman, T.M. Smith, **P.J. Shamberger**, B. Qiu, X. Ruan, A. K. Roy, A. A. Voevodin. Cross-plane thermal properties of transition metal dichalcogenides, *Appl. Phys. Lett.*, **102**, 081604 (2013). doi: 10.1063/1.4793203
17. **Shamberger, P.J.**, T. Reid. Thermophysical Properties of Potassium Fluoride Tetrahydrate from (243 to 348) K, *J. Chem. Eng. Data*, **58**, 294-300 (2013). doi: 10.1021/je300854w
16. Amama, P.B., J.T. Grant, **P.J. Shamberger**, A.A.Voevodin, T.S. Fisher, Improved Dehydrogenation Properties of Ti-Doped LiAlH₄: Role of Ti Precursors, *J. Phys. Chem. C*, **116**, 21886-21894 (2012). doi: 10.1021/jp307225w
15. Wohlwend, J., P. Amama, **P.J. Shamberger**, V. Varshney, A. Roy, T. Fisher, Effects of Ti-Containing Additives on the Dehydrogenation Properties of LiAlH₄: A Combined Computational and Experimental Study, *J. Phys. Chem. C*, **116**, 22327-22335 (2012). doi: 10.1021/jp3050109
14. **Shamberger, P.J.**, T. Reid. Thermophysical Properties of Lithium Nitrate Trihydrate from (253 to 353) K, *J. Chem. Eng. Data*, **57**, 1404-1411 (2012). doi: 10.1021/je3000469

13. Amama, P.B., J.T. Grant, J.E. Spowart, **P.J. Shamberger**, A.A. Voevodin, and T.S. Fisher. Catalytic influence of Ni-based additives on the dehydrogenation properties of ball milled MgH₂, *J. Mater. Res.* **26**, 2725-2734 (2011). doi: 10.1557/jmr.2011.230

2007-2010 (PHD)

12. **Shamberger, P.J.**, A.B. Pakhomov, K. Koyama, and F.S. Ohuchi. Deviation of the magnetization change from the structural phase transition temperature in polycrystalline Ni-Mn-Sn in low magnetic fields, *Scripta Mater.*, **63**(12), 1161-1164 (2010). doi: 10.1016/j.scriptamat.2010.08.017
11. Kazarinoff, P.D., **P.J. Shamberger**, F.S. Ohuchi, and C.K. Luscombe, OTFT performance of air-stable ester-functionalized polythiophenes, *J. Mater. Chem.*, **20**, 3040-3045 (2010). doi: 10.1039/b927164c
10. Wang, Y., O. Acton, G.G. Ting, T. Weidner, **P.J. Shamberger**, H. Ma, F.S. Ohuchi, D.G. Castner, and A. K.-Y. Jen, Effect of the phenyl ring orientation in the polystyrene buffer layer on the performance of pentacene thin-film transistors, *Organic Electronics*, **11**(6), 1066-1073 (2010). doi: 10.1016/j.orgel.2010.03.006
9. Acton, O., G.G. Ting, **P.J. Shamberger**, F.S. Ohuchi, H. Ma, and A. K.-Y. Jen, Dielectric Surface-Controlled Low-Voltage Organic Transistors via *n*-Alkyl Phosphonic Acid Self-Assembled Monolayers on High-*k* Metal Oxide, *Applied Materials & Interfaces*, **2**(2), 511-520 (2010). doi: 10.1021/am9007648
8. **Shamberger, P.J.**, and F.S. Ohuchi. Hysteresis of the martensitic phase transition in magnetocaloric-effect Ni-Mn-Sn alloys, *Phys. Rev. B*, **79**(14), 144407 (2009). doi: 10.1103/PhysRevB.79.144407
7. Briseno, A.L., S.C.B. Mannsfeld, **P.J. Shamberger**, F.S. Ohuchi, Z. Bao, S.A. Jenekhe, and Y. Xia. Self-assembly, molecular packing, and electron transport in n-type polymer semiconductor nanobelts, *Chemistry of Materials*, **20**(14), 4712-4719 (2008). doi: 10.1021/cm8010265
6. Lu, C.Y., **P.J. Shamberger**, E. Yitamben, K. Beck, A. Joly, M.A. Olmstead, and F.S. Ohuchi. Laser and Electrical Current Induced Phase Transformation of In₂Se₃ Semiconductor Thin Film on Si (111), *Applied Physics A*, **93**(1), 93-98 (2007). doi: 10.1007/s00339-008-4776-8
5. Feaver, A., S. Sepehri, **P. Shamberger**, A. Stowe, T. Autrey, and G. Cao. Coherent Carbon Cryogel-Ammonia Borane Nanocomposites for H₂ Storage, *J. Phys. Chem. B*, **111**(26), 7469-7472 (2007). doi: 10.1021/jp072448t

2006-2007 (MS)

4. Vazquez, J., **P.J. Shamberger**, and J.E. Hammer. Plutonic Xenoliths Reveal the Timing of Magma Evolution at Hualalai and Mauna Kea, Hawaii, *Geology*, **35**(8), 695-698 (2007). doi: 10.1130/G23495A.1
3. **Shamberger, P.J.**, and M. O. Garcia. Geochemical modeling of magma mixing and magma reservoir volumes during early episodes of Kilauea Volcano's Pu'u 'O'o eruption. *Bull. Volc.*, **69**(4), 345-352 (2007). doi: 10.1007/s00445-006-0074-5
2. **Shamberger, P.J.**, and J.E. Hammer. Leucocratic and Gabbroic Xenoliths from Hualalai Volcano, Hawai'i. *J. Petrology*, **47**(9), 1785-1808 (2006). doi: 10.1093/petrology/egl027
1. Hammer, J.E., M. Coombs, **P.J. Shamberger**, and J.-I. Kimura. Submarine sliver in North Kona: A window into the early magmatic and growth history of Hualalai Volcano, Hawaii. *J. Volcanol. Geotherm. Res.*, **151**(1-3), 157-188 (2006). doi: 10.1016/j.jvolgeores.2005.07.028

*Post-Docs, * Graduate Students, # Undergraduate Students under supervision of P.J. Shamberger

VIII. OTHER PUBLICATIONS

COMMENTARY/NEWS & VIEWS

1. **P.J. Shamberger**, Thermal Storage: Mapping Design Tradeoffs, *Nature Energy*, **6**, 221-222 (2021).
doi: 10.1038/s41560-021-00803-y

IX. REFEREED PROCEEDINGS

IN PRESS

18. N. Malone, S. Chakravarty*, S. Zhang, D. Talebi, S.V. Sankarraman, E. Pool, D. Park, E. Iverson, C. Wiley, **P.J. Shamberger**, D. Antao, M. Gardner, H. Toliyat, P. Enjeti, B. Rasmussen, J. Grunlan, B. Moble, J. Felts, 'Investigation of Mass Savings Potential of Zeolite Integrated Motor Thermal Management Systems in All-Electric Commercial Aircraft', *Proceedings of the ASME 2022 International Mechanical Engineering Congress and Exposition, IMECE2022*, Nov. 22, 2022.

PUBLISHED

17. S. Ahmed*, R. Mach*, H. Jones#, F. Alamo#, **P.J. Shamberger**, 'Solidification of Salt Hydrate Eutectics Using Multiple Nucleation Agents', in *REWAS 2022: Energy Technologies and CO2 Management (Volume II)*, ed. F. Tesfaye, L. Zhang, D. Post Guillen, Z. Sun, A. Abullahi Baba, N. R. Nellameggham, M. Zhang, D. E. Verhulst, S. Alam, (TMS, 2022), pp. 139-147. doi: /10.1007/978-3-030-92559-8
16. A. Shrestha*, B. Alexander, D. Pounds, **P.J. Shamberger**, Reduced Order Numerical Model and Design of Hybrid Oscillating Heat Pipe-Phase Change Material Panels, *20th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2021)*.
15. A. Hoe*, C. Martinez*, M. Barako, **P.J. Shamberger**, Dynamic Characterization of Phase Change Materials Under Harmonic Heating, *20th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2021)*.
14. A. Tamraparni, A. Hoe*, M. Deckard*, C. Zhang, A. Elwany, **P.J. Shamberger**, J. Felts, Experimental Validation of Composite Phase Change Material Optimized for Thermal Energy Storage *20th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2021)*.
13. **P.J. Shamberger**, A. Hoe*, M. Barako, Effects of Boundary Conditions on the Dynamic Response of a Phase Change Material, *19th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2020)*.
12. K. Gohil, M. Deckard*, **P.J. Shamberger**, N. Jain, A Reduced Order Model for Analyzing Heat Transfer in a Thermal Energy Storage Module, *19th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2020)*.
11. A. Hoe*, A. Easley, M. Deckard*, J. Felts, **P.J. Shamberger**, Forward Selection Methodology for Phase Change Material Composite Optimization, *19th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2020)*.
10. A. Hoe*, M. Deckard*, J. Felts, **P.J. Shamberger**, A Numerical Analysis of Conductive Heat Transfer in Cylindrical Thermal Energy Storage Composites, *18th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2019)*.
9. M. Deckard*, M. Fish, M. Berman, J. Wang, L. Boteler, **P.J. Shamberger**, Convergence and Validation in ParaPower: A Design Tool for Phase Change Materials in Electronics Packaging, *18th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm, 2019)*.

8. M. Deckard*, J. Felts, **P.J. Shamberger**, Cooling Power and Thermal Buffering in Composite Heatsinks, *17th IEEE Intersoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems* (ITherm, 2018).
7. C.-N. Chang, B. Semma, M. Pardo, D. Fowler, **P.J. Shamberger**, R. Arróyave, Data-Enabled Discovery and Design of Energy Materials (D3EM): Structure of An Interdisciplinary Materials Design Graduate Program, *MRS Advances*, **1-6**, 1404-1411 (2017). doi: 10.1557/adv.2017.228
6. **Shamberger, P.J.**, E. Jung^x, Y. Zhou, R. Arróyave, M. Radovic, "Psychometric Analysis of the Materials Concept Inventory: Limitations of the Principle Assessment Tool for Introductory Materials Science Courses," *Mid Years Engineering Experience (MYEE) Conference, Session F1A*, (MYEEC, College Station, TX, 2015).
5. Amama, P.B., **P.J. Shamberger**, T.S. Fisher, "Modified Metal Hydrides for High-Capacity Thermal Energy Storage," *SAMPE J.*, (SAMPE 2012, Baltimore, MD, 2012).
4. **Shamberger, P.J.**, D.E. Forero[#], Towards High Energy Density, High Conductivity Thermal Energy Storage Composites, in *Proc. of the ASME 2012 3rd Micro/Nanoscale Heat & Mass Transfer International Conf.*, (MNHMT2012, Atlanta, GA, 2012).
3. **Shamberger, P.**, A. Pakhomov, and F. Ohuchi. Isothermal Martensitic Transformation Kinetics in Ni-Mn-Sn Ferromagnetic Shape Memory Alloys, in *Materials, Devices, and Characterization for Smart Systems III*, (Mater. Res. Soc. Symp. Proc. Volume 1200E, Warrendale, PA, 2010).
2. **Shamberger, P.**, A. Pakhomov, and F. Ohuchi. Deviation of Bulk Magnetic Property Changes From Martensitic Transition Temperature in Ni-Mn-Sn Heusler Alloys at Low Fields, in *MS&T '09 CD Proceedings from the Materials Science & Technology 2009 Conference (October 25-29, 2009, Pittsburgh)*, (MS&T Partner Societies, 2009).
1. **Shamberger, P.J.**, and F.S. Ohuchi. Hysteresis in Thermal and Magnetic Field-Induced Martensitic Phase Transitions in Ni-Mn-Sn Heusler Alloys, in *Materials, Devices, and Characterization for Smart Systems III*, edited by J. Su, L-P. Wang, Y. Furuya, S. Trolier-McKinstry, and J. Leng (Mater. Res. Soc. Symp. Proc. Volume 1129, Warrendale, PA, 2009), 1129-V12-03.

^x Post-Docs, ^{*} Graduate Students, [#] Undergraduate Students under supervision of P.J. Shamberger

X. TECHNICAL PRESENTATIONS

2022

116. **P.J. Shamberger**, Thermal Challenges of Transient Loads for Defense Applications (**oral/panel**), Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), San Diego, CA (May, 2022).
115. **P.J. Shamberger**, S. Chakravarty*, W. Mo*, N. Ozganov[#], Use of Pressure as an Unconventional Dynamic Control Variable on Desorption-based Thermal Energy Storage, MRS Spring 2022, Honolulu, HI (May, 2022).
114. R. Gurrola*, A. Bradicich*, N. Person[#], T.-M. Lu, **P.J. Shamberger**, Modification of the MIT via anisotropic transport in epitaxial irradiated VO₂, MRS Spring 2022, Honolulu, HI (May, 2022).
113. A. Bradicich*, **P.J. Shamberger**, Temperature perturbations causing temporally stable current density localization in VO₂, MRS Spring 2022, Honolulu, HI (May, 2022).
112. A. Hoe*, A. Tamraparni, C. Zhang, A. Elwany, J. Felts, **P.J. Shamberger**, Design of Phase Change Material Composites for Efficient and Rapid Storage of Thermal Energy (**oral**), TMS Annual Meeting, Anaheim, CA (Mar, 2022).

111. S. Ahmed*, R. Mach, H. Jones, F. Alamo, **P.J. Shamberger**, Solidification of Salt Hydrate Eutectics Using Multiple Nucleation Agents (**oral**), TMS Annual Meeting, Anaheim, CA (Mar, 2022).
110. J.C. Lago*, W. Cho, D. Salas, Y. Zhang*, I. Karaman, **P.J. Shamberger**, Effect of mesoscale L21 domain size on the nucleation of thermoelastic martensitic transformation in Ni₄₅Co₅Mn_{36.7}In_{13.3} shape memory alloys (**oral**), TMS Annual Meeting, Anaheim, CA (Mar, 2022).

2021

109. A. Hoe*, A. Tamraparni, C. Zhang, A. Elwany, J. Felts, **P.J. Shamberger**, Objective Oriented Design of Phase Change Material Composites (**oral**), MRS Fall 2021, Boston, MA (Nov, 2021).
108. C.M. Shoalmire#, A. Hoe*, M. Shanks, N. Jain, **P.J. Shamberger**, Ragone Relationships in Thermal Batteries to Evaluate Phase Change Material Composite Design (**poster**), MRS Fall 2021, **virtual** (Dec, 2021).
107. S. Chakravarty*, D. Sharar, **P.J. Shamberger**, Heterogeneous Nucleation of Gallium with lattice-matched cubic carbides and nitrides phases (**poster**), MRS Fall 2021, Boston, MA (Nov, 2021).
106. S. Chakravarty*, D. Sharar, **P.J. Shamberger**, Decreased Undercooling in Gallium-Based Phase Change Materials via Epitaxial Nucleation Catalysts (**oral**), InterPACK 2021, Virtual (Oct, 2021).
105. A. Hoe*, M. Barako, A. Tamraparni, C. Zhang, A. Elwany, J. Felts, **P.J. Shamberger**, An Application-Centric Design Tutorial for Phase Change Materials Composites (**oral & poster**), InterPACK 2021, Virtual (Oct, 2021).
104. A. Shrestha*, B. Alexander, D. Pounds, **P.J. Shamberger**, Reduced Order Numerical Model and Design of Hybrid Oscillating Heat Pipe-Phase Change Material Panels (**oral**), (ITHERM), Virtual (May, 2021).
103. A. Hoe*, C. Martinez, M. Barako, **P.J. Shamberger**, Dynamic Characterization of Phase Change Materials Under Harmonic Heating (**oral & poster**), (ITHERM), Virtual (May, 2021).
102. A. Tamraparni, A. Hoe*, M. Deckard*, C. Zhang, A. Elwany, **P.J. Shamberger**, J. Felts, Experimental Validation of Composite Phase Change Material Optimized for Thermal Energy Storage (ITHERM), Virtual (May, 2021).

2020

101. **P.J. Shamberger**, H. Clarke*, A. Bradicich*, A. Yano*, D. Sellers, E. Braham, S. Banerjee. Control of Metal-Insulator Transition Character in VO₂ through Chemical Doping (**oral**), MRS 2020, Virtual (Nov, 2020).
100. Y. Zhang*, **P.J. Shamberger**. Exploring hysteresis mechanisms during martensitic phase transformations in microscale Ni-Mn-Sn Heusler alloy films and Ni-Co-Mn-Sn alloy particles (**oral**), MRS 2020, Virtual (Nov, 2020).
99. A. Bradicich*, H. Clarke*, E.J. Braham, A. Yano*, D. Sellers, S. Banerjee, **P.J. Shamberger**. Indirect observation of domain-by-domain transition through electrical characterization of B-VO₂ (**oral**), MRS 2020, Virtual (Nov, 2020).
98. A. Hoe*, M. Barako, **P.J. Shamberger**, Experimental Observations on the Dynamic Response of Phase Change Materials (**oral**), InterPACK 2020, Virtual (Oct, 2020).
97. K. Gohil, M. Deckard*, **P.J. Shamberger**, N. Jain, Development of a Reduced Order Model for Analyzing Heat Transfer in a Thermal Energy Storage Module, Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), Orlando, FL (May, 2020).

96. A. Hoe*, **P.J. Shamberger**, Forward Selection Methodology for Phase Change Material Composite Optimization, Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), Orlando, FL (May, 2020).
95. **P.J. Shamberger**, A. Hoe*, M. Deckard*, M.T. Barako, Effects of Boundary Conditions on the Dynamic Response of a Phase Change Material, Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), Orlando, FL (May, 2020).

2019

94. V. Wilson, J. Felts, **P.J. Shamberger**, Actively Cooled Leading Edges in Extreme Environments (**oral**), Boeing R&T Technical Seminar (Dec., 2019). **{INVITED}**
93. Thermal Energy Storage in High Effective Effusivity Composites: Reduced Order Models to Enable Materials Design (**oral**), Rice University, Mechanical Engineering, Houston, TX (Nov., 2019). **{INVITED}**
92. S. Choi, L. Boteler, P. DeBock, **P.J. Shamberger**, N. Niedbalski, D. Huitink, Transient Thermal Management: Considering Thermal Capacitance and Not Just Thermal Resistance (**oral/panel**), InterPACK 2019, Anaheim, CA (Oct, 2019).
91. **P.J. Shamberger**, A. Hoe*, M. Deckard*, A. Tamraparni, A. Elwany, J. Felts, Lamellar Phase Change Material Composites for Power Electronics Thermal Management (**oral**), InterPACK 2019, Anaheim, CA (Oct, 2019).
90. A. Hoe*, M. Barako, **P.J. Shamberger**, Characterizing Dynamic Response of Phase Change Materials (**oral**), InterPACK 2019, Anaheim, CA (Oct, 2019).
89. N. Jain, **P.J. Shamberger**, Optimal Design of Thermal Energy Storage Modules (**oral**), CITMAV Workshop, W. Lafayette, IN (Sept., 2019).
88. **P.J. Shamberger**[%], J. Felts[%], A. Elwany, Cooling Power and Thermal Buffering in Composite Heatsinks (**oral**), ONR Thermal Science and Engineering Program Review, Atlanta, GA (June, 2019). [%]co-presented.
87. M.E. Deckard*, M. Fish, M. Berman, J. Wang, L. Boteler, **P.J. Shamberger**, Convergence and Validation in ParaPower: A Design Tool for Phase Change Materials in Electronics Packaging (**oral**), Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), Las Vegas, NV (May, 2019).
86. A. Hoe*, A. Easley, M.E. Deckard*, J. Felts, **P.J. Shamberger**, Cylindrical Investigation and Optimization of Phase Change Material Composites (**oral**), Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), Las Vegas, NV (May, 2019).
85. H. Clarke*, D. Sellers, E. Braham, R. Villareal, T. Brown*, R. Arróyave, S. Banerjee, **P.J. Shamberger**. Boron Doped VO₂ Devices Demonstrating Cycling Dependent Hysteresis (**oral**), MRS Spring Meeting, Phoenix, AZ (Apr, 2019).
84. T. Brown*, **P.J. Shamberger**. Phase microstructure evolution observed by local magnetic force microscopy in (Mn,Fe)₂(P,Si) (**oral**), TMS Annual Meeting, San Antonio, TX (Mar, 2019).
83. H. Clarke*, B. Carraway[#], D. Sellers, E. Braham, R. Arróyave, S. Banerjee, **P.J. Shamberger**. Size Dependence of Nucleation Controlled Hysteresis in Free-Standing VO₂ Rods (**oral**), TMS Annual Meeting, San Antonio, TX (Mar, 2019).
82. Y. Zhang*, J. Billman[#], **P.J. Shamberger**. Size Effects on Hysteresis in Electrochemically Deposited Thick Film NiMnSn Heusler Alloys (**poster**), TMS Annual Meeting, San Antonio, TX (Mar, 2019).

81. M. Deckard*, A. Hoe*, J. Felts, **P.J. Shamberger**. Transient Response of Composite PCMs to Periodic Heat Pulses (**oral**), TMS Annual Meeting, San Antonio, TX (Mar, 2019).
80. D. Perez-Nunez, A. Hoe*, **P.J. Shamberger**. Heat Transfer in Lamellar Phase Change Material Composite Heatsinks (**oral**), TMS Annual Meeting, San Antonio, TX (Mar, 2019).
79. A. Hoe*, M. Deckard*, A. Tamrapami, A. Elwany, J. Felts, **P.J. Shamberger**. Transient Heat Transfer in Phase Change Material Composites (**oral**), TMS Annual Meeting, San Antonio, TX (Mar, 2019).
78. N. Jain, **P.J. Shamberger**, Optimal Design of Thermal Energy Storage Modules (**oral**), CITMAV Workshop, W. Los Angeles, CA (Feb., 2019).
77. **P.J. Shamberger**, Testbed for High Frequency (1 Hz to 1 kHz) Characterization of Thermal Energy Storage Materials (**oral**), CITMAV Workshop, Los Angeles, CA (Feb., 2019).

2018

76. **P.J. Shamberger**, T.D. Brown*, J. Van Buskirk#, D. Galvan#, Effect of Phase Segregation on Phase Transformation Behavior in (Mn,Fe)₂(P,Si) Alloys (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2018).
75. T.D. Brown*, **P.J. Shamberger**, Orientation Relationships and Lattice Matching Effects on Hysteresis in (Mn,Fe)₂(P,Si) Phase Transitions (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2018).
74. Y. Zhang*, J. Billman#, **P.J. Shamberger**, Thickness Dependent Size Effects on Hysteresis in Electrochemically Deposited Thick Film NiMnSn Heusler Alloys (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2018).
73. N. Jain, **P.J. Shamberger**, Optimal Design of Thermal Energy Storage Modules (**oral**), CITMAV Workshop, W. Lafayette, IN (Sept., 2018).
72. **P.J. Shamberger**, Testbed for High Frequency (1 Hz to 1 kHz) Characterization of Thermal Energy Storage Materials (**oral**), CITMAV Workshop, W. Lafayette, IN (Sept., 2018).
71. **P.J. Shamberger**%, J. Felts%, A. Elwany, Cooling Power and Thermal Buffering in Composite Heatsinks (**oral**), ONR Thermal Science and Engineering Program Review, Atlanta, GA (June, 2019). %co-presented.
70. M. Deckard*, J. Felts, **P.J. Shamberger**, Cooling Power and Thermal Buffering in Composite Heatsinks Materials (**oral**), Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), San Diego, CA (May, 2018).
69. **P.J. Shamberger**, Testbed for High Frequency (1 Hz to 1 kHz) Characterization of Thermal Energy Storage Materials (**oral**), CITMAV Workshop, Los Angeles, CA (Feb., 2018).
68. **P.J. Shamberger**, High-Q Heatsinks: High Cooling Power Composite Phase Change Materials (**oral**), CITMAV Workshop, Los Angeles, CA (Feb., 2018).

2017

67. **P.J. Shamberger**, Rechargeable NH₃ Salts for Highly Transient Thermal Management (**oral**), CITMAV Workshop, W. Lafayette, IN (Sept., 2017).
66. **P.J. Shamberger**, High-Q Composite Heatsinks: High Cooling Power Composites (**oral**), CITMAV Workshop, W. Lafayette, IN (Sept., 2017).
65. P. Karimineghlani, E. Emmons*, **P.J. Shamberger**, S. Sukhishvili, Thermoreversible polyvinyl alcohol gel as a matrix for controlling fluidity of an inorganic phase change material (**poster**), ACS Annual Meeting, Washington, DC (Aug, 2017).

64. H. Clarke*, T.D. Brown*, A. Reed, K. Leedy, R. Ganguli, **P.J. Shamberger**, Effects of Forming Voltage and Oxide Microstructures on Conductive Filament Shape in p+Si/HfO₂/Cu Devices (**poster**), 59th Electronic Materials Conference, South Bend, IN (June, 2017).
63. **P.J. Shamberger**, Advancing Teaching Effectiveness through Analysis: Lessons from Video Analytics and Concept Inventories (**oral**), ASEE Annual Meeting, Columbus, OH (Jun, 2017). {INVITED}
62. **P.J. Shamberger**, Design of Thermal Energy Storage Materials and Composites (**oral/panel**), Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM), Orlando, FL (May, 2017).
61. T.D. Brown*, **P.J. Shamberger**, Assessing Performance of Caloric Material Refrigerants through Hysteretic Thermodynamic Modeling (**oral**), MRS Annual Spring Meeting, Phoenix, AZ (Apr, 2017).
60. T.D. Brown*, D. Galvan#, **P.J. Shamberger**, Thermodynamically Based Comparisons of GMCE Refrigerant Performance (**poster**), TMS 2017: 146th Annual Meeting and Symposium, San Diego, CA (Feb., 2017).
59. **P.J. Shamberger**, Rechargeable NH₃ Salts for Highly Transient Thermal Management (**oral**), CITMAV Workshop, Torrance, CA (Feb., 2017).
58. **P.J. Shamberger**, High-Q Composite Heatsinks (**oral**), CITMAV Workshop, Torrance, CA (Feb., 2017).
57. N. Maniscalco, D. Altman, **P.J. Shamberger**, Advantages and Suitability of Utilizing Hydrated Salts for high-Rate low-SWaP Thermal Energy Storage (**oral**), DEPS Annual Symposium, Huntsville, AL (Feb., 2017).
56. **P.J. Shamberger**, Design of Engineered Thermal Materials (**oral**), Materials Science Departmental Seminar, UNT, Denton, TX (Jan, 2017). {INVITED}

2016

55. C.-N. Chang, M. Pardo, B. Semma, D. Fowler, R. Arróyave, **P.J. Shamberger**, Data-Enabled Discovery and Design of Energy Materials (D3EM): Structure of An Interdisciplinary Materials Design Graduate Program (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2016).
54. Y. Zhang*, **P.J. Shamberger**, Compositional Control of Thick-film Ni-Mn-Sn Heusler Alloys by Electrochemical Deposition (**poster**), MRS Annual Fall Meeting, Boston, MA (Nov, 2016).
53. T.D. Brown*, H. Clarke*, **P.J. Shamberger**, Resolving Conductive Filament Morphology in Crystalline and Amorphous HfO₂-based Programmable Metallization Memory Cells (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2016).
52. E. Emmons*, A. McClellan#, **P.J. Shamberger**, Corrosion of Typical Heat Exchanger Materials in Contact with Salt Hydrate for Thermal Energy Storage Applications (**poster**), TAMU Energy Research Society: Conference on Energy (2016).
51. T.D. Brown*, T. Buffington#, D. Galvan#, **P.J. Shamberger**, Efficiency-based comparisons of conventional and magnetic refrigerant performance in refrigeration cycles (**oral**), TAMU Energy Research Society: Conference on Energy (2016).
50. P. Karimineghlani, E. Emmons#, **P.J. Shamberger**, S. Sukhishvili, Thermoreversible Polyvinyl Alcohol Hydrogel as a Matrix for Salt Hydrate Thermal Energy Storage Materials (**poster**), ACS Annual Meeting, Philadelphia, PA (Aug, 2016).
49. **P.J. Shamberger**, Rechargeable NH₃ Salts for Highly Transient Thermal Management (**oral**), CITMAV Workshop, Purdue Univ., IN (Aug, 2016).

48. A. Reed[%], **P.J. Shamberger[%]**, J. Wohlwend, The Role of Material Defects in Growth and Disruption of Conductive Filaments in Metal-Oxide Dielectric Layers (**oral**), AFOSR Extreme Environments Program Review, Arlington, VA (May, 2016). [%]co-presented.
47. **P.J. Shamberger**, A. Muenzenberger, Advancing Effectiveness of the Flipped Classroom through Video Analytics (**oral**), 2nd Mid-Years Engineering Experience Conference (MYEEC), College Station, TX (Mar, 2016).
46. **P.J. Shamberger**, Thermal Energy Storage Materials (**oral/panel**), AIAA SciTech Forum and Exposition, San Diego, CA (Jan, 2016). {INVITED}

2015

45. **P.J. Shamberger**, E. Jung^x, Zhou, Y., R. Arróyave, M. Radovic, Development of an Assessment Tool to Evaluate Instructional Effectiveness in an Introductory Materials Science Course (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2015).
44. **P.J. Shamberger**, M. O'Malley, Rapid Discovery and Design of Nucleation Agents for High Volumetric Density Salt Hydrate Thermal Storage Materials (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2015).
43. **P.J. Shamberger**, J. Wohlwend, A. Roy, A. Voevodin, Computational Prediction of TiO₂ (rutile) Grain Boundary Energies Using Reactive MD Potentials (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2015).
42. T.D. Brown^{*}, N. Bruno, J.H. Chen, J. Ross, I. Karaman, **P.J. Shamberger**, Thermodynamic Analysis of Irreversible Thermal Energy Conversion Cycles in Giant Magnetocaloric Effect Materials (**oral**), MRS Annual Fall Meeting, Boston, MA (Nov, 2015).
41. **P.J. Shamberger**, E. Jung^x, A. Muenzenberger, Instructor Peer Network to Disseminate Active Learning Pedagogy (**oral**), IEEE Tea-time seminar, College Station, TX (Nov, 2015).
40. T.D. Brown^{*}, **P.J. Shamberger**, Improving GMCE-Based Refrigeration: Modeling Magnetic Entropy Change Effects in Hysteretic Systems (**poster**), SES Fall 2015 Meeting, College Station, TX (Oct, 2015).
39. H. Clarke^{*}, A.N.Reed, A.A. Voevodin, **P.J. Shamberger**, HfO₂ Grain Boundary Structure and Resistance Switching Device Variability (**poster**), 57th Electronic Materials Conference, Columbus, OH (June, 2015).
38. A. Voevodin[%], **P.J. Shamberger[%]**, J. Wohlwend, The Role of Material Defects in Growth and Disruption of Conductive Filaments in Metal-Oxide Dielectric Layers (**oral**), AFOSR Extreme Environments Program Review, Arlington, VA (May, 2015). [%]co-presented.
37. **P.J. Shamberger**, E. Jung^x, R. Arróyave, T. Hartwig, M. Radovic, Use of Large Introductory Classes to Propagate Active Teaching Methods (**oral**), IEEE Seminar, College Station, TX (May, 2015).
36. Brown, T.D.^{*}, J. Chen, N. Bruno, J. Ross, I. Karaman, **P.J. Shamberger**. Analyzing Irreversibility in Magnetic Refrigeration Cycles (**poster**), Materials Advantage Symposium. Texas A&M University (April, 2015).
35. A.N.Reed^{*}, J.J. Hu, J. Wohlwend, R.D. Naguy, J.E. Bultman, C. Muratore, **P.J. Shamberger**, A.A. Voevodin, Investigation of Plasma Conditions and Film Growth during Reactive HiPIMS of HfO₂ Films (**oral**), International Conference on Metallurgical Coatings & Thin Films, 42nd ICMCTF, San Diego, CA (April, 2015).
34. **P.J. Shamberger**, E. Jung^x, Y. Zhou, R. Arróyave, M. Radovic, Psychometric Analysis of the Materials Concept Inventory: Limitations of the Principle Assessment Tool for Introductory Materials Science

Courses (oral), 1st Mid-Years Engineering Experience Conference (MYEEC), College Station, TX (Mar, 2015).

33. **P.J. Shamberger**, E. Jung^x, Y. Zhou, R. Arróyave, M. Radovic, Towards More Effective Education in Materials Science for Engineering Students (oral), Materials Science & Engineering Symposium, TAMU-Q, Doha, Qatar (Mar, 2015). **{INVITED}**
32. **P.J. Shamberger**, T.D. Brown^{*}, J. Murley[#], J.H. Chen, J. Ross, N. Bruno, I. Karaman, Approaches to Analyze Cycle Efficiency in Magnetocaloric Materials (oral), TMS Middle East, MEMA, Doha, Qatar (Jan, 2015).

2014

31. **P.J. Shamberger**, J. Wohlwend, J.J. Hu, A.A. Voevodin, Tilt Boundary Energies in Polycrystalline HfO₂ (oral), MRS Annual Fall Meeting, Boston, MA (Nov, 2014).
30. A.N.Reed^{*}, J.J. Hu, **P.J. Shamberger**, R.D. Naguy, J.E. Bultman, A.A. Voevodin, Comparison of HiPIMS and Pulsed DC-Deposited HfO₂ films for Resistive Switching Memory Applications (poster), MRS Annual Fall Meeting, Boston, MA (Nov, 2014).
29. A.A. Voevodin, C. Muratore, J.J. Hu, B. Wang, J.E. Bultman, M.L. Jespersen, **P.J. Shamberger**, R. Stevenson, A. Waite, M.E. McConney, R. Smith. Growth of 2D MoS₂ Films by Magnetron Sputtering, AVS International Symposium & Exhibition, Baltimore, MD (Nov, 2014).
28. T. Torno[#], N. Bruno, I. Karaman, **P.J. Shamberger**, Coupling between martensitic structures and magnetic domains in Heusler alloys near phase transition temperatures (oral), Gulf Coast Undergraduate Research Symposium, Houston, TX (Oct, 2014).
27. J. Murley[#], T. Brown, N. Bruno, J.-H. Chen, I. Karaman, J. Ross, **P.J. Shamberger**, An Indirect Approach to Magnetocaloric Entropy (oral), Gulf Coast Undergraduate Research Symposium, Houston, TX (2014). **Best presentation award for session.**
26. J. Wohlwend, **P.J. Shamberger**, A.K. Roy, A.A. Voevodin, The Role of Intrinsic Defects in Growth and Disruption of Conductive Filaments in Metal-Oxide Resistance Switch Devices (oral), International Conference on Superlattices, Nanostructures and Nanodevices (ICSNN), Savannah, GA (2014).
25. A. Voevodin[%], **P.J. Shamberger**[%], J. Wohlwend, The Role of Material Defects in Growth and Disruption of Conductive Filaments in Metal-Oxide Dielectric Layers (oral), AFOSR Extreme Environments Program Review, Arlington, VA (2014). [%]co-presented.
24. **P.J. Shamberger**, Towards High Energy Density Thermal Storage Composites (oral), Materials Science Seminar, Texas A&M University, College Station, TX (2014).
23. **P.J. Shamberger**, A. Waite, J. Bultman, A. Voevodin, Tunability of Resistance Switching Characteristics in W/GeO_x/Cu Thin Film Devices (poster), MRS Annual Spring Meeting, San Francisco, CA (2014).

2011-2013 (AFRL)

22. P.B. Amama, **P.J. Shamberger**, Development of carbon-based adsorbent for CO₂ adsorption (oral), AIChE 2012 Annual Meeting, Pittsburgh, PA (2012).
21. Wohlwend, J. P. Amama, **P.J. Shamberger**, A. Roy, First principles investigation of Nitrogen-based functional groups on activated carbon and their effect on CO₂ adsorption (poster), NanoTechnology for Defense Conference in Summerlin, NV (2012).
20. P.B. Amama, **P.J. Shamberger**, T.S. Fisher, Modified Metal Hydrides for High-Capacity Thermal Energy Storage (oral), SAMPE 2012, Baltimore, MD (2012).

19. P.B. Amama, J. Grant, **P. Shamberger**, A. Voevodin, T.S. Fisher, Modified Lithium Alanate for High-Capacity Thermal Energy Storage (**oral**), International Conference on Metallurgical Coatings & Thin Films, 39th ICMCTF, San Diego, CA (2012).
18. **Shamberger, P.J.**, D.E. Forero[#], Towards High Energy Density, High Conductivity Thermal Energy Storage Composites (**oral**), ASME 3rd Micro/Nanoscale Heat & Mass Transfer International Conf., Atlanta, GA (2012).
17. P.B. Amama, **P.J. Shamberger**, T.S. Fisher, Modified Metal Hydrides for High-Capacity Thermal Energy Storage (**oral**), ASME 3rd Micro/Nanoscale Heat & Mass Transfer International Conf., Atlanta, GA (2012).
16. **Shamberger, P.J.**, Phase Change-based Thermal Energy Storage for High Power Lasers and Microwaves (**oral**), Directed Energy Professional Society, La Jolla, CA (2011).
15. **Shamberger, P.J.**, T.S. Fisher, A. Roy, A.A. Voevodin, J.E. Spowart, P.B. Amama, J. Sihn, V. Varshney, J. Wohlwend, Thermal Decomposition of Homogeneous LiAlH₄ Solutions (**oral**), 38th International Conference on Metallurgical Coatings and Thin Films, San Diego, CA (2011).
14. Wohlwend, J.L., P.B. Amama, V. Varshney, **P.J. Shamberger**, A.K. Roy, and T.S. Fisher, First Principles Study of the Effect of Titanium Additives on the Bonding Nature and Hydrogen Vacancy Migration in Lithium Alanate (**oral**), MRS Annual Spring Meeting, San Francisco, CA (2011).

2006-2010 (PHD)

13. **Shamberger, P.J.**, A.B. Pakhomov, and F.S. Ohuchi, Isothermal Martensitic Transformation Kinetics in Ni-Mn-Sn Ferromagnetic Shape Memory Alloys (**oral**), MRS Annual Fall Meeting, Boston, MA (2009).
12. **Shamberger, P.J.**, A.B. Pakhomov, and F.S. Ohuchi, Deviation of bulk magnetic property changes from martensitic transition temperature in Ni-Mn-Sn Heusler alloys at low fields (**oral**), MS&T 2009, Pittsburgh, PA (2009).
11. **Shamberger, P.J.**, A. Pakhomov, and F.S. Ohuchi, Energy Transfer in Magnetocaloric Effect Heusler Alloys (**oral/poster**), Frontier of Energy Flow Dynamics in Atomistic and Electronic Scales, Sendai, Japan (2009). {INVITED}
10. **Shamberger, P.J.**, and F.S. Ohuchi, Hysteresis in Thermal and Magnetic Field-Induced Martensitic Phase Transitions in Ni-Mn-Sn Heusler Alloys (**oral**), MRS Annual Fall Meeting, Boston, MA (2008).
9. **Shamberger, P.J.**, and F.S. Ohuchi, Temperature- and Magnetic Field-Induced Martensitic Phase Transformations in Ni₅₀Mn₃₄Sn₁₆ (**oral**), AVS Pacific Northwest Regional Meeting, Richland, WA (2008).
8. Ho, J., H.S. Rogers, and **P.J. Shamberger**, Building Interdisciplinary and Cross Cultural Awareness in Environmental Research (**oral**), Canadian Studies Graduate Symposium, University of Washington, Seattle, WA (2007).
7. Polwarth, C., **P.J. Shamberger**, and F.S. Ohuchi, Thermoelectric Properties of Indium-Tin Oxide (**poster**), AVS Pacific Northwest Regional Meeting, Portland, OR (2006).
6. Feaver, A., **P.J. Shamberger**, T. Autrey, and G.Z. Cao, Hydrogen Desorption in Novel Carbon Cryogel - Hydride Composites (**poster**), MRS Annual Spring Meeting, San Francisco, CA (2006).

2001-2005 (MS/UG)

5. Vazquez, J., **P.J. Shamberger**, and J.E. Hammer, Timing of extreme magmatic differentiation at Hualalai and Mauna Kea volcanoes from 238U-230Th and U-Pb dating of zircons from plutonic xenoliths (**poster**), *EOS Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract V13A-0518 (2005).
4. **Shamberger, P.J.**, and J.E. Hammer, Extreme magma differentiation in a Hawaiian magma chamber: An analysis of gabbro and syenite xenoliths from Hualalai Volcano (**poster**), *EOS Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract V12D-0615 (2003).
3. Hammer, J.E., and **P.J. Shamberger**, Dynamic submarine flanks of Hualalai Volcano, HI (**poster**), *EOS Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract V22C-0602 (2003).
2. **Shamberger, P.J.**, J.E. Hammer, and M. Coombs, Stratigraphy and geochemistry of submarine volcanoclastics in North Kona, Hualalai (**poster**), Cities on Volcanoes 3 meeting in Hilo, HI (2003).
1. Gardner, J.E., A. Burgisser, and **P.J. Shamberger**, Experimental Constraints on Degassing and Permeability in Volcanic Conduit Flow (**poster**), *EOS Trans. AGU*, 82(47), Fall Meet. Suppl., Abstract V21B-0976 (2001).

*Post-Docs, * Graduate Students, # Undergraduate Students under supervision of P.J. Shamberger

XI. ADVISING/MENTORING

Postdocs/ Researchers (2 total, 2 women)

1. **Anil Aryal*** "Neuromorphic Materials and Devices," 2020-present.
 2. Delia Perez-Nunez "Development of Thermal Energy Storage Materials," 2017-2018.
 3. Amy Bolon* "Nucleation Catalysts in KF·4H₂O," 2017.
 4. Eunju Jung* "Psychometric Analysis of the Materials Concept Inventory," 2014-2015.
- Current group member.* * Primary Advisor.

Ph.D. Dissertations (12 total, 8 women, 3 URM)

1. **Fevronia Andreaou** "TBD," est. May 2027. (primary advisor: L. Katehi)
 2. **Chase Somodi*** "TBD," est. May 2027.
 3. **Denali Ibbotson*** "TBD," est. May 2026.
 4. **Sophia Ahmed*** "TBD," est. May 2025.
 5. **Juan Carlos Lago Larios*** "Defect-driven Mechanisms in Nucleation of Thermoelastic Martensitic Transformations," est. May 2024.
 6. **Rebeca Gurrola*** "Control of VO₂ through Strain," est. May 2024.
 7. **Sourav Chakravarty*** "Rapid Heat Dissipation through Combined Evaporation and Desorption from Composite Zeolite Thermal Energy Storage Media," est. May 2024.
 8. **Adelaide Bradicich*** "Electronic Behavior of Neuromorphic Metal-Insulator Transition Devices," est. May 2023.
 9. **Alison Hoe*** "Design of Composite Thermal Energy Storage Materials," May 2022. {Lockheed Martin}
 10. **Yijia Zhang*** "Size Effects on Thermoelastic Martensitic Transformations in Heusler Alloys," Dec 2020.
 11. **Tim Brown*** "Engineering Hysteresis and Non-Diffusive Phase Transformations in Magnetocaloric (Mn,Fe)₂(P,Si) Alloys for Magnetic Refrigeration Applications," Aug 2019. {Post-Doc, R.S. Williams, TAMU}
 12. **Heidi Clarke*** "Local Characterization of Resistance Switching Phenomena in Transition Metal Oxides," May 2019. {Samsung Semiconductors}
- Current group member.* * Primary Advisor.

M.S. Thesis (5 total, 3 women)

1. **Mason Shoalmire*** “...,” est. May 2024.
2. **Aashik Shrestha*** “Design of Hybrid Oscillating Heat Pipe-Phase Change Material Panels,” May 2022.
3. **Wenting (Ella) Mo*** “Engineered Adsorbents for Thermal Energy Storage,” May 2022.
4. **Michael Deckard*** “Conductive Heat Transfer in Composite Phase Change Material Heatsinks,” Dec 2021.
5. **Aliya Yano*** “Effect of Chemical Doping on Metal-Insulator Phase Transition in VO₂,” Dec 2020.
6. **Emily Emmons*** “Corrosion of Common Heat Exchanger Materials by Lithium Nitrate Trihydrate,” Aug 2017. {Samsung Semiconductors}

*Current group member. Graduated member. {current position}. * Primary Advisor.*

UG Researchers (54 total, 23 women, 15 URM)

1. **Alex Foncerrada⁺**, “Materials Informatics of Plastic Crystals”, TAMU (2022-present).
2. **Veronica Gonzalez Fernandez⁺**, “Measurement of Phase Change Materials Dynamics”, TAMU (2022-present).
3. **Colton Brietzke⁺**, “Numerical Simulation of Phase Change Materials Dynamics”, TAMU (2022-present).
4. **Jose Cortes⁺**, “Dynamic response of PCM under time-variant loading”, TAMU (2021-present).
5. **Emilio Morales-Cortazar⁺**, “Thermal conductivity of high temperature alloys”, TAMU (2021-present).
6. Gabby Garza, “Thermal conductivity of molten salt hydrates”, TAMU (2021-2022).
7. Albert Franke, “Robust cycling in liquid-hydrated zeolite-PVA composites”, TAMU (2021-2022).
8. Nurbek Ozganov, “Processing of zeolite thick films”, TAMU (2021-2022).
9. Nicole Person, “Irradiation of VO₂ devices”, **Sandia National Lab Summer Internship 2021**, TAMU (2021-2022). {GS – TAMU, PI: Butler}
10. Mason Shoalmire, “Energy and Power Density of TES modules”, **1st place UG Student Speaking Symposium, Fall 2021 (ASM)**, TAMU (2020-present). {GS – TAMU, PI: Shamberger}
11. Drew Worthy, “Machine Learning of Material Thermophysical Properties”, TAMU (2020-2021). {GS – Lamar University}
12. Ezra Duke, “Heat Transfer in Zeolite Powder Beds”, **Summer 2019 REU**, TAMU (2021). {ASML}
13. Natalie Patton, “Energy and Power Density of TES modules”, **Summer 2021 REU**, TAMU (2021). {Pajarito Powder}
14. Andrew Mirea, “Machine Learning of Material Thermophysical Properties”, TAMU (2020-2021).
15. Fabiola Alamo, “Thermal Transport in Liquid Salt Hydrates”, TAMU (2019-2021). {HighRadius}
16. Haley Jones, “Development of Salt hydrate PCM eutectics”, TAMU (2018-2021). {GS – Penn State University}
17. Andrew Balog, “Electrical Characterization of VO₂ Devices”, TAMU (2018-2021). {GS – Penn State University}
18. Carolina Martinez, “Characterization of Phase Change Dynamics in a Slab”, TAMU (2019-2020). {Oncor Electric Delivery}
19. Samantha Felten, “Machine Learning of Material Thermophysical Properties”, TAMU (2020).
20. Anh Tran⁺, “Numerical Simulation of Melting Problems”, TAMU (2019-2020).
21. Julia Billman, “Microscopic Observations of Hysteresis in Magnetocaloric Alloys,” **Clare Boothe Luce Fellow**, (2017-2020). {GS – Colorado School of Mines}
22. Hunter Harris, “Thermophysical Properties of Salt Hydrate Eutectics”, TAMU (2019-2020). {KC National Security Campus}
23. Nathan Turner, “Synthesis and Characterization of Salt Hydrate PCMs”, TAMU (2018-2020). {capSpire}

24. Jessica Paredez, "Synthesis and Properties of Salt Hydrates", TAMU (2018-2019). {FujiFilm Diosynth Biotechnologies}
25. Jenny Gosney, "Isothermal Transformation Kinetics in Salt Hydrate PCMs", **Summer 2019 REU**, NC State (2019). {Kimley-Horn}
26. John Moynihan, "Measuring Reversibility and Solidification Rates in Salt Hydrates," TAMU (2017-2019). {Newmont Goldcorp Corporation}
27. Daniel Galvan*, "Assessing the Performance of Fe₂P Alloys Under Various Magnetic Refrigeration Cycles," **Summer 2016 REU**, TAMU (2016-2019). {Med School – UT Southwestern}
28. Laura Deremo, "Failure of Non-volatile Resistance Switches," TAMU (2017-2018). {Texas Instruments}
29. Gabriela Lammoglia, "Materials Design of Magnetocaloric Alloys", **Summer 2018 NextGen Intern**, TAMU (2018). {Lincoln Memorial University- School of Medical Sciences}
30. Nandha Ramasamy, "Magnetic Force Microscopy of MCE materials," TAMU (2018). {Bell Flight}
31. Thomas Jordan, "Dissipative Neuromorphic Materials," TAMU (2018).
32. Jonathan van Buskirk*, "Hysteresis in MCE Materials", TAMU (2018). {GS – UW-Madison}
33. Sara Wonner, "Nucleation in Salt Hydrate PCMs", **Summer 2018 REU**, UT-Knoxville (2018).
34. Joseph Anderson*, "Crystallography of VO₂," TAMU (2017-2018). {GS – Purdue}
35. Aaron Garcia, "Measuring Reversibility and Solidification Rates in Salt Hydrates," TAMU (2017-2018). {Bureau Veritas}
36. Bill Caraway*, "Optical Observations of Metal-Insulator Transformations in Hydrothermal Doped VO₂," TAMU (2016-2017). {GS – UIUC}
37. Molly Jones*, "Nucleation and Growth Processes in Magnetocaloric Alloys," **Summer 2017 REU**, (Summer 2017). {GS – Univ. Southern Mississippi}
38. Sunita Kumari*, "Characterization of Insulating Thermal Composites," **TAMU/IITK exchange**, (Summer 2017). {GS – IITK}
39. Elizabeth Yee, "Decomposition of Ammonia Salts," TAMU (2017).
40. Nick Gripp*, "Decomposition of Ammonia Salts," TAMU (2016-2017). {GS – TAMU}
41. Ben Musil, "Decomposition of Ammonia Salt," TAMU (2016). {Applied Materials}
42. Siddharth Srivastava*, "FEM Simulation of Resistance Switching Phenomena," **TAMU/IITK exchange**, (Summer 2016). {GS – IITK}
43. Adam McClellan, "Corrosion of Thermal Storage Container Materials," TAMU (2016).
44. Sarah Hammock*, *Undergraduate Honors thesis*, "Characterization of HfO₂ Resistance Switching Devices," TAMU (2015-2017). {GS – UW, Seattle}
45. Tyler Buffington*, *Undergraduate Honors thesis*: "Thermodynamic Efficacy of Irreversible Magnetocaloric Effect Cycles," TAMU (2014-2016). {GS – UT Austin}
46. Xander Majek, "Effect of bottom electrode on reversible resistance switching in ALD grown HfO₂ devices," TAMU (2015).
47. Yasushi Mizuno*, "Entropy maximization in low melting point alloys," TAMU (2014-2015). {GS – TAMU}
48. Taylor Messinger, "Processing of salt hydrates for thermal energy storage," TAMU (2015).
49. Shelby Turner*, "Reversible resistance switching in ALD grown HfO₂ devices," TAMU (2015). {GS – Ecole Centrale Lyon}
50. Gbotemi Balogun, "Effect of surface roughness on resistance switching in sputtered HfO₂ devices," TAMU (2014). {Cummins, Inc.}
51. Trey Torno, "Imaging of magnetic domain structures in magnetocaloric Heusler alloys near the phase transition" **recipient of 2014 Undergraduate Summer Research Grant, TAMU, Coll. Station**, TAMU (2014). {Alcon}
52. Anna Rubin, "Salt-Hydrate gels for thermal energy storage," TAMU (summer 2014). {Boeing}

53. Joshua Murley, “Indirect measurement of S(T,H) in magnetocaloric effect materials,” Recipient of: **2015 Undergraduate Summer Research Grant, TAMU; 2015 Undergraduate Research Ambassador, TAMU (2014-2015).** {Samsung}
54. Pawan Bhandari, “Entropy maximization in low melting point alloys,” TAMU (2014). {Cognizant}

At AFRL

55. Shanyce Stewart*, “Resistance switching in W/GeOx/Cu devices,” AFRL (2011-2012). {Global Foundaries}
56. Daniel Forero, “High-*k* Thermal Energy Storage Composites,” AFRL (2011-2012).
57. Sha’Nique Mackay, “Undercooling in Salt Hydrates,” AFRL (2014).
- Current group member. {current position}. * pursued graduate degree. + currently TAMU UG.*

HS Researchers (1 total, 1 women)

1. Joey Tindall, “Transformation in doped VO₂ particles,” TAMU (2019).
2. Erika Salzman, “Undercooling and glassification in salt hydrates,” TAMU (2015-2017). {UG – Caltech} *{current position}*

XII. TEACHING

- Fall 2021 **MSEN 617:** Crystallography and Crystal Structure Determination. Instructor.
- Spr 2021 **MSEN 260:** Structure of Materials. Instructor.
- Fall 2020 **MSEN 205:** Materials in Society. Instructor.
- Spr 2020 **MSEN 260:** Structure of Materials. Instructor.
- Fall 2019 **MSEN 205:** Materials in Society. Instructor. Avg. Eval. 3.83/5.0*
- Fall 2019 **CHEN 322:** Chemical Engineering Materials. Instructor. Avg. Eval. 3.80/5.0*
- Spr 2019 **MSEN 260:** Structure of Materials. Instructor. Avg. Eval. 4.20/5.0
- Fall 2018 **MSEN 205:** Materials in Society (**New**). Instructor. Avg. Eval. 4.29/5.0*
- Spr 2018 **CHEN 313:** Chemical Engineering Materials. Instructor. Avg. Eval. 4.10/5.0
- Fall 2017 **MSEN 310:** Structure of Materials. Instructor. Avg. Eval. 4.35/5.0
- Spr 2017 **MSEN 222:** Materials Science. Instructor, *course coordinator*. Avg. Eval. 3.71/5.0
- Fall 2016 **MSEN 310:** Structure of Materials (**Re-Developed**). Instructor. Avg. Eval. 4.26/5.0
- Spr 2016 **MSEN 201:** Fundamentals of Materials Science (**New**). Instructor. Avg. Eval. 3.76/5.0
- Fall 2015 **MEEN 222:** Materials Science. Instructor. Avg. Eval. 4.20/5.0
- Spr 2015 **MEEN 222:** Materials Science. Instructor. Avg. Eval. 4.63/5.0
- **MEEN 489:** Electr, Opt, and Mag Prop. of Mtls (**New**). Instructor. Avg. Eval. 4.08/5.0
- Fall 2014 **MEEN 222:** Materials Science. Instructor. Avg. Eval. 4.52/5.0
- Spr 2014 **MEEN 222:** Materials Science. Instructor. Avg. Eval. 4.44/5.0

** Weighted average of honors section and traditional section.*

Also:

- **MSEN 484:** Undergraduate Internship. Coordinator.
- **MSEN 491:** Undergraduate Research. Instructor.
- **MSEN 681:** Graduate Seminar. Coordinator.
- **MSEN 691:** Graduate Research. Instructor.

XIII. PROFESSIONAL SOCIETIES

- IEEE, Member (2022 - present)
 - Electronics Packaging Committee (2022 – present)
- TMS, Member (2014 - present)
 - Education Committee (2020 - 2023)
 - FMD / Energy Storage and Conversion Committee (ECSC) (2022 – present)
 - FMD / Magnetic Materials Committee (MMC) (2022 – present)
 - FMD / Electronics Packaging and Interconnects (EPIC) (2022 – present)
- Materials Research Society, Member (2006 – present)
 - Academic Affairs Committee / Education Subcommittee (2016 – 2019)
- ASEE, Member (2016-2018)

XIV. SYNERGESTIC ACTIVITIES

APPOINTMENTS

- Texas A&M Institute of Data Science, Faculty Research Affiliate (2019 – present)
- Texas A&M Energy Institute, Affiliated Faculty Member (2015 – present)

JOURNAL EDITOR

- Frontiers in Mechanical Engineering, Review Editor, *Process and Energy Systems Engineering* (2021 – present)
- Frontiers in Mechanical Engineering/Thermal Engineering, Review Editor, *Heat Transfer Mechanisms and Applications* (2022 – present);
- Frontiers in Mechanical Engineering, Review Editor, *Thermal & Mass Transport* (2016 – 2022)

JOURNAL REVIEWER (LAST 5 YEARS)

- ACS Applied Materials & Interfaces, ACS
- Advanced Materials, Wiley
- AIAA Journal, AIAA
- Applied Energy, Elsevier
- Applied Physics Letters, AIP
- Applied Polymer Science, Wiley
- Applied Sciences, MDPI
- Chemistry of Materials, ACS journal
- Crystals, MDPI
- Energies, MDPI
- Frontiers in Energy Research, Frontiers
- Frontiers in Mech Engineering, Frontiers
- Industrial & Engineering Chemistry Research, ACS journal
- International Journal of Heat and Mass Transfer, Elsevier
- Journal of Alloys and Compounds, Elsevier
- Journal of Applied Physics, AIP journal
- Journal of Electronic Packaging, ASME
- Journal of Energy Storage, Elsevier

- Journal of Heat Transfer, ASME
- Journal of Materials Chemistry, A, RSC
- Journal of Materials Research and Technology, Elsevier
- Journal of Materials Science, Springer
- Journal of Materials Science: Materials in Electronics, Springer
- Journal of Physical Chemistry, C, ACS journal
- Journal of Thermophysics & Heat Review, AIAA
- Materials, MDPI
- Materials Chemistry and Physics, Elsevier
- Materials Letters, Elsevier
- Materials Today, Elsevier
- Nano Energy, Elsevier
- Nature Energy, Springer Nature
- Physical Review Letters, APS
- Proceedings of the National Academy of Sciences, NAS
- ASME Conference Proceedings
- IThERM Conference Proceedings
- MRS Conference Proceedings

PROPOSAL REVIEWER

- Fonds National Suisse (Swiss National Science Foundation)
- Israel Science Foundation
- Army Research Office
- ERC Consolidator Grant (E.U.)
- NSF Review Panel: CBET:TTP; DMR:MMN; EPSCOR; GRFP
- DoD Review Panel: SMART Fellowship
- ACS Petroleum Research Fund
- AFOSR (2013 – 2014)
- ARPA-E (2012)
- USAF Small Business Innovation Research (2010 – 2013)

SYMPOSIUM ORGANIZER/CHAIR

- *IThERM (2017 – present): Intersoc. Conf. on Thermal and Thermomech Phenomena in Electr. System*
 - Track Co-Chair: System-level Thermal Management (2021, 2022)
 - Session Chair: Solid-Liquid Phase Change – Materials and Modelling Session Chair (2020), Thermal Experimental Methods (Nano-To-Macro Scale) Session Chair (2018,2019)
 - Tech Talk Panel Session Chair: Transient Thermal Management (2017, 2019, 2020)
- Gulf Coast Undergraduate Research Symposium: Analytical Chemistry (2014)
- DEPS Annual Symposium: Thermal Management for RF & Laser Systems (2011)
- DEPS Annual Symposium: High Power DEW Thermal Management (2011)

SHORT COURSES/WORKSHOPS

- MSEN Graduate Student Fellowship Writing Workshop, TAMU (2014 – 2016, 2018 – present)
- An Inverted Class Taken to New Heights with Analytics, 12th Annual Teaching with Technology Conference, TAMU (2016)
- Thermal Energy Storage Materials, CITMAV Symposium, Dayton, OH (2015)

ACADEMIC SERVICE COMMITTEES

DEPARTMENT SERVICE

- **MSEN Undergraduate Degree Program Director** (2015 – present)
- MSEN Soft Matter for Electronics faculty search (2021 – present)
- MSEN UG Awards committee (2018 – present)
- MSEN Strategic Planning Committee (2019 – 2020)
- MSEN/PHYS joint faculty search (2019 – 2020)
- **MSEN Undergraduate Curriculum Committee Chair** (2015 – 2020)
- MSEN *ad hoc* committee to establish “Materials Science Minor” (2014)

COLLEGE SERVICE

- **College of Eng. Undergraduate Council on Academic Affairs (UCAA) committee** (2018 – present)
- College of Eng. Hypersonics faculty search (2020– 2021)
- 1st year Engineering Course Review (MSEN Rep.) (2015)
- USRG selection committee (MSEN Rep.) (2015 – present)
- College of Engineering Undergraduate Advisor (UGA) committee (2014 – 2019)
- College of Science Undergraduate Program Coordinator (UPC) committee (2015 – 2017)

UNIVERSITY SERVICE

- Protection of Controlled Unclassified Information (pCUI) university task force (2017)
- AggieFab Steering Committee, TAMU (2016 – 2017)

GRADUATE COMMITTEES

- **MSEN PhD Committees (14)**, Shreyas Balachandran* (2015); Cengiz Yegin* (2016); Jordan Evans (2017); Luke Johnson (2019); Karthik Sridhara (2019); Tse-Ming (Gavin) Chiu (2019); Azhar Ali (2020); Christa Torrence (2020); Tejas Umale (2020); Felipe Beltran (2021); Meelad Ranaiefar (20XX); Ryan Brito (20XX); Xueqin Huang (20XX); Woohyun Cho (20XX); Digvijay Yadav (20XX); Jiaqi Dong (20XX).
- **MSEN MS Committees (3)**, Taylor Smith (2015), Yenny Cubides Gonzalez (2016), Joshua Hope (2019), Xiuzhu Zhu (20XX), Jessica Zamarripa (20XX), Monika Singh (20XX).
- **MSEN QE Committees (50)**, (2014 – Spr 2022).
- **Non-MSEN TAMU Committees**
 - **PhD Committees (13)**, Xiaodan Li, CVEN (2016); Yefan Tian, PHYS (2017); Pavel Lapa*, PHYS (2017); William Maximuck, CHEM (2020); Nicholas Cool, CHEM (20XX); Achutha Tamraparni, MEEN (20XX); Hung-Ta Chien, ECEN (20XX); Guan-Wen Liu, CHEM (20XX); Richard Livingston, NUEN (20XX); SeungSu Kim, NUEN (20XX); Syed Mohammad Hameed Ul Haq, MEEN (20XX); Rijul Chauhan (20XX); Ethan Iverson, CHEM (20XX).
 - **MS Committees (9)**, Chia-Hsi Hsieh, M.Arch., ARCH (2015); Brent Bielefeldt*, MS, AERO (2016); Elizabeth Castanon, MS, NUEN (2016); Yesenia Salazar, MS, NUEN (2019); Clifford Hart, MS,

NUEN (2019); Moiz Butt, MS, NUEN (20XX); Jadha Gunawan, MS, MEEN (20XX); Kyle Williams, MS, NUEN (20XX); Zach Wilson, MS, MEEN (2022).

- External Committees (1), Karan Gohil, MS, MEEN, Purdue University (2020).
- Academy for Future Faculty Mentees (1), Peter Morcos, MSEN (2021);

* *substitute member*

EDUCATIONAL OUTREACH

- Department Info Saturday, MSEN Coordinator. (2018 – present)
- Academy for Future Faculty, Faculty Mentor. (2016 – 2021)
- Aggieland Saturday, MSEN Coordinator. (2016 – 2019)
- Organize MSEN outreach to underrepresented HS student groups. (2015 – 2020).
 - ENGAGE Summer Camp Dept. Fair – targets underrep. HS students.
 - Lab demos & for WE IDEAS – targets female HS students.
- Materials Advantage, Advisor. TAMU (2014 – 2018)
- Youtube “Intro to Materials Science” channel, Creator. >2.2M views, >130k hrs. watched, >18k subscribers; viewed from all 50 states, >120 countries, 6 continents. 75% international viewers. (2014 – present)
- Dayton Regional STEM School FIRST Robotics teams, Coach. (2011 – 2013)
 - Winner of the Outstanding FTC Coach Award for the state of Ohio (2013)
- AFRL/RX STEM Outreach Coordinator (2010 – 2013)