

---

## Taylor D. Sparks

Associate Professor and Associate Chair  
Materials Science and Engineering Department  
122 Central Campus Drive  
University of Utah, Salt Lake City, 84112

Office: CME room 314

Email: [sparks@eng.utah.edu](mailto:sparks@eng.utah.edu)

Phone: (801) 581-8632

Website: [www.eng.utah.edu/~sparks](http://www.eng.utah.edu/~sparks)

### ❖ Publications: (underlined are undergraduate co-authors, \* are Sparks Group members)

#### Submitted

1. Jason R. Hall\*, Steven K. Kauwe\*, and **Taylor D. Sparks** “Machine Learning Applications of Particle Packing with Large Size Variations” *under review*.
2. Su Kong Chong, Lizhe Liu, **Taylor D. Sparks**, Feng Liu and Vikram V. Deshpande “Topological Phase Transitions in a Hybridized Three-Dimensional Topological Insulator” *under review*.
3. Anthony Yu-Tang Wang\*, Steven K. Kauwe\*, Ryan Murdock\*, and **Taylor D. Sparks** “Compositionally-Restricted Attention-Based Network for Materials Property Prediction,” ChemRxiv preprint. [\[DOI\]](#)
4. Logan G. Kiefer\*, Christian J. Robert\*, and **Taylor D. Sparks** “Lifetime of electrochromic optical transition cycling of ethyl viologen diperchlorate-based electrochromic devices” *under review*.
5. Akira Nagaoka, Kenji Yoshino, Taizo Masuda, **Taylor D. Sparks**, Michael A. Scarpulla, and Kensuke Nishioka “Environmentally friendly thermoelectric pure sulfide Cu<sub>2</sub>ZnSnS<sub>4</sub> with dimensionless figure of merit exceeding 1.0 barrier” *under review*.
6. Steven K Kauwe\*, Yuchung Yang, and **Taylor D. Sparks** “Visualization Tool for Atomic Models (VITAL): A Simple Visualization Tool for Materials Predictions” ChemRxiv preprint. [\[DOI\]](#)

#### Accepted or published

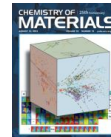
1. (invited) Marianne Liu\*, Conrad Clement\*, Kathy Liu, Xuming Wang, and **Taylor D. Sparks** “An Experimental-Computational Approach for Advanced Solid Polymer Electrolyte Design,” *accepted to Computational Materials Science*, October 5 2020.
2. Ryan Murdock\*, Steven K. Kauwe\*, Anthony Yu-Tang Wang\*, and **Taylor D. Sparks** “Is domain knowledge necessary for machine learning materials properties?” *accepted to Integrating Materials and Manufacturing Innovation on July 7 2020*. [\[DOI\]](#)
3. (invited) Amber Barron\* and **Taylor D. Sparks** “Commercial Marine-degradable Polymers for Flexible Packaging” *iScience*, **23**, 101353, (2020). [\[DOI\]](#)
4. Steven K. Kauwe\*, Taylor M. Welker, and **Taylor D. Sparks** “Extracting Knowledge from DFT: Experimental Band Gap Predictions Through Ensemble Learning” *Integrating Materials and Manufacturing Innovation, published online July 24 2020*. [\[DOI\]](#)
5. (invited) Anthony Yu-Tang Wang, Ryan J. Murdock\*, Steven K. Kauwe\*, Anton O. Oliynyk, Aleksander Gurlo, Jakoah Brgoch, Kristin A. Persson, and **Taylor D. Sparks** “Machine Learning for Materials Scientists: An introductory guide towards best practices” *Chemistry of Materials*, **32**, [12], 4954–4965 (2020). [\[DOI\]](#)
6. Jason Nance\* and **Taylor D. Sparks** “From Streetlights to Phosphors: a Review on the Visibility of Roadway Markings,” *Progress in Organic Coatings*, **148**, 105749 (2020). [\[DOI\]](#)
7. Conrad Clement\*, Steven K. Kauwe\*, and **Taylor D. Sparks** “Benchmark AFLOW Data Sets for Machine Learning,” *Integrating Materials and Manufacturing Innovation*, **9**, 153-156 (2020). [\[DOI\]](#)
8. Jason Nance\* and **Taylor D. Sparks** “Comparison of Coatings for SrAl<sub>2</sub>O<sub>4</sub>:Eu<sup>2+</sup>,Dy<sup>3+</sup> powder in Waterborne Road Striping Paint under Wet Conditions” *Progress in Organic Coatings*, **148**, 105749 (2020). [\[DOI\]](#)

9. [Brennan Theler\\*](#), Steven K. Kauwe\*, and **Taylor D. Sparks** “Materials abundance, price, and availability data from the years 1998 to 2015” *Integrating Materials and Manufacturing Innovation*, **9**, 144-150 (2020). [\[DOI\]](#)
10. (invited) [Andrew R. Falkowski\\*](#) and **Taylor D. Sparks** “The Materialism podcast: Exploring new avenues for materials science education” *Matter*, **2**, [2] 276-278 (2020). [\[DOI\]](#)
11. (invited) Steven K. Kauwe\*, Jake Graser\*, [Ryan Murdock\\*](#), and **Taylor D. Sparks** “Can machine learning find extraordinary materials?” *Computational Material Science*, **174**, 109498 (2020). [\[DOI\]](#)
12. Su Kong Chong, Ryuichi Tsuchikawa, Jared Harmer, **Taylor D. Sparks**, and Vikram V. Deshpande “Landau Levels of Topologically-Protected Surface States Probed by Dual-Gated Quantum Capacitance” *ACS Nano* **14**, [1], 1158-1165 (2020). [\[DOI\]](#)
13. (invited) **Taylor D. Sparks**, Steven K. Kauwe\*, Marcus E. Parry\*, Aria Tehrani Mansouri, and Jakoah Brgoch “Machine learning for structural materials” *Annual Reviews of Materials Research*, **50**, 27-48 (2020). [\[DOI\]](#)
14. (invited) Florian Belviso, Victor E. P. Claerbout, Aleix Comas-Vives, N. Dalal, F. Fan, Alessio Filippetti, Vincenzo Fiorentini, Lucas Foppa, Cesare Franchini, Benjamin Geisler, Luca M. Ghiringhelli, Axel Groÿ, Shunbo Hu, Jorge Íñiguez, Steven K. Kauwe\*, J. Musfeldt, Paolo Nicolini, Rossitza Pentcheva, Tomas Polcar, W. Ren, Fabio Ricci, Francesco Ricci, Huseyin Sener Sen, Jonathan M. Skelton, **Taylor D. Sparks**, Alessandro Stroppa, Andrea Urru, Matthias Vandichel, P. Vavassori, H. Wu, K. Yang, Hong Jian Zhao, Danilo Puggioni, Remedios Cortese, and Antonio Cammarata “Viewpoint: Atomic-scale design protocols towards energy, electronic, catalysis and sensing applications” *Inorganic Chemistry*, **58**, [22], 14939-14980 (2019). [\[DOI\]](#)
15. (invited) Marcus Parry\*, Samantha Couper, Aria Mansouri Tehrani, Anton O. Oliynyk, Jakoah Brgoch, Lowell Miyagi, and **Taylor D. Sparks** “Lattice strain and texture analysis of superhard Mo<sub>0.9</sub>W<sub>1.1</sub>BC and ReWC<sub>0.8</sub> via diamond anvil cell deformation” *Journal of Materials Chemistry A*, **7**, as part of the Emerging Investigators Special Issue, 24012-24018 (2019). [\[DOI\]](#)
16. Aria Mansouri Tehrani, Anton O. Oliynyk, Zeshan Rizvi, Sogol Lotfi, Marcus Parry\*, **Taylor D. Sparks**, and Jakoah Brgoch “Atomic substitution to balance hardness ductility and sustainability in molybdenum tungsten borocabide” *Chemistry of Material*, **31**, [18], 7696-7703 (2019). [\[DOI\]](#)
17. Alexander Szendrei\*, **Taylor D. Sparks**, and Anil V. Virkar “Three and Four-Electrode Electrochemical Impedance Spectroscopy Studies using Embedded Composite Thin Film Pseudo-Reference Electrodes in Proton Exchange Membrane Fuel Cells” *Journal of the Electrochemical Society*, **166**, [12], F784-F795 (2019). [\[DOI\]](#)
18. Leila Ghadbeigi\*, **Taylor D. Sparks**, and Anil V. Virkar “Electrochemical Studies on Na-β”-Alumina + Yttria-Stabilized Zirconia (YSZ) Composite Mixed Na<sup>+</sup>-Ion-O<sup>2-</sup>-Ion Conductors” *Journal of the Electrochemical Society*, **166**, [10], F679-F686 (2019). [\[DOI\]](#)
19. Su Kong Chong, Kyu Bum Han\*, **Taylor D. Sparks**, and Vikram V. Deshpande “Tunable Coupling between the Paired Surface States in 3D Topological Insulator” *Physical Review Letters*, **123**, 036804 (2019). [\[DOI\]](#)
20. Shadi Al Khateeb\* and **Taylor D. Sparks** “Pore-graded and conductor and binder free FeS<sub>2</sub> films deposited by spray pyrolysis for high performance lithium ion batteries” *Journal of Materials Research*, **34**, [14], 2456-2471 (2019). [\[DOI\]](#)
21. **Taylor D. Sparks**, Aleksander Gurlo, Maged F. Bekheet\*, Michael W. Gaultois, Gennady Cherkashinin, Laetitia Laversenne and David R. Clarke “The high-temperature structure of Co<sub>3</sub>O<sub>4</sub>: Understanding spinel inversion using in situ and ex situ measurements” *Physical Review B*, **99**, 104104 (2019). [\[DOI\]](#)
22. [Benjamin Gilmore\\*](#), [Zachary Luscher\\*](#), Kyle Roberts, George Fisher, and **Taylor D. Sparks** “Comparison of fatigue in fiber-backed PVDF and PFA fluoropolymer linings” *Polymer Degradation and Stability*, **162**, 122-128 (2019). [\[DOI\]](#)
23. (invited) Steven K. Kauwe\*, Trevor David Rhone, and **Taylor D. Sparks** “Data-driven studies of lithium-ion-battery materials” *Crystals*, **9**, [1] 54 (2019). [\[DOI\]](#)
24. Isaac Nelson, Taylor A. Ogden, Shadi Al Khateeb\*, Jake Graser\*, **Taylor D. Sparks**, Jake J. Abbott, and Steven E. Naleway “Freeze casting of surface-magnetized Fe<sub>3</sub>O<sub>4</sub> particles with a Helmholtz coil in a unidirectional static magnetic field to fabricate materials inspired by bone” *Advanced Engineering Materials*, 1801092, (2018). [\[DOI\]](#)
25. Kyu-Bum Han\*, Sukong Chong, Anton O. Oliynyk, Akira Nagaoka, [Suzanne Petryk\\*](#), Michael Scarpulla, Vikram Deshpande, and **Taylor D. Sparks** “Enhancement in surface mobility and quantum transport

- of Bi<sub>2-x</sub>Sb<sub>x</sub>Te<sub>3-y</sub>Se<sub>y</sub> topological insulator by controlling the crystal growth conditions” *Scientific Reports*, **8**:17290 (2018). [\[DOI\]](#)
26. Su Kong Chong, Kyu Bum Han\*, Akira Nagaoka, Ryuichi Tsuchikawa, Renlong Liu, Haoliang Liu, Z. Vally Vardeny, Dmytro A. Pesin, Changgu Lee, **Taylor D. Sparks** and Vikram V. Deshpande “Topological Insulator-Based van der Waals Heterostructures for Effective Control of Massless and Massive Dirac Fermions” *Nano Letters*, **18**, [12], 8047-8053 (2018). [\[DOI\]](#)
  27. Shadi Al Khateeb\* and **Taylor D. Sparks** “Spray pyrolysis of conductor and binder free porous FeS<sub>2</sub> films for high performance lithium ion batteries” *Journal of Materials Science*, **54**, [5], 4089-4104 (2019). [\[DOI\]](#)
  28. Dong Zhang, Anton O. Oliynyk, [Gabriel M. Duarte](#), Abishek K. Iyer, Leila Ghadbeigi\*, Steven K. Kauwe\*, **Taylor D. Sparks**, and Arthur Mar “Not Just Par for the Course: Over 72 Quaternary Germanides RE<sub>4</sub>M<sub>2</sub>XGe<sub>4</sub> (RE = La-Nd, Sm, Gd-Tm, Lu; M = Mn-Ni; X = Ag, Cd) and the Search for Intermetallics with Low Thermal Conductivity” *Inorganic Chemistry*, **57**, [22], 14249-14259 (2018). [\[DOI\]](#)
  29. Aria Mansouri Tehrani, Anton O. Oliynyk, Marcus Parry\*, [Zeshan Rizvi](#), Samantha Couper, Feng Lin, Lowell Miyagi, **Taylor D. Sparks**, Jakoah Brgoch “Machine learning directed search for ultraincompressible, high hardness materials” *Journal of the American Chemical Society*, **140**, [31], 9844-9853 (2018). [\[DOI\]](#).
  30. **Taylor D. Sparks**, Aleksander Gurlo, Michael W. Gaultois, and David R. Clarke “A revised model for thermopower and site inversion in Co<sub>3</sub>O<sub>4</sub> spinel” *Physical Review B*, **98**, [2], 024108 (2018). [\[DOI\]](#).
  31. Jake Graser\*, Steven K. Kauwe\*, and **Taylor D. Sparks** “Machine learning and energy minimization approaches for crystal structure predictions: A review and new horizons” *Chemistry of Materials*, **30**, [11], 3601-3612, (2018). [\[DOI\]](#).
  32. Steven K. Kauwe\*, Jake Graser\*, [Antonio Vazquez\\*](#), and **Taylor D. Sparks** “Machine learning prediction of heat capacity for solid inorganics” *Integrating Materials and Manufacturing Innovation*, **7**, [2], 43-51 (2018). [\[DOI\]](#).
  33. Kyu-Bum Han\*, Jake Graser\*, [Alexandre Stella\\*](#), John Fuertez, [Van Nguyen](#), John McLennan, and **Taylor D. Sparks** “Calcium alginate polymer encapsulation of proppant with time-release delivery of microbial consortia for methanogenesis” *Hydraulic Fracturing Journal*, **5**, [3], 62-74 (2018).
  34. Leila Ghadbeigi\*, [Brandon Day\\*](#), [Kristina Lundgren\\*](#), and **Taylor D. Sparks** “Cold temperature performance of phase change material based battery thermal management systems” *Energy Reports*, **4**, 303-307 (2018). [\[DOI\]](#).
  35. Alex Zevalkink, David M. Smiadek, Jeff L. Blackburn, Andrew J. Ferguson, Michael L. Chabynec, Olivier Delaire, Jian Wang, Kirill Kovnir, Joshua Martin, Laura T. Schelhas, **Taylor D. Sparks**, Stephen D. Kang, Maxwell T. Dylla, G. Jeffrey Snyder, Brenden Ortiz, and Eric Toberer “A practical field guide to thermoelectrics: fundamentals, synthesis, and characterization” invited article, *Applied Physics Reviews*, **5** [2] 021303 (2018). [\[DOI\]](#).
  36. Kyu-Bum Han\*, Jake Graser\*, [Christian J. Robert\\*](#), [Laercio Martins de Mendonca Filho\\*](#), John McLennan, and **Taylor D. Sparks** “Synthesis and microstructural evolution in iron oxide kaolinite based proppant as a function of reducing atmosphere, sintering conditions, and composition” *Ceramics International*, **44**, [8], 9976-9983 (2018). [\[DOI\]](#).
  37. Clayton Cozzan, [Guillaume Lheureux](#), Nicholas O’Dea, Emily Levin, Jake Graser\*, **Taylor D. Sparks**, Shuji Nakamura, Steven DenBaars, Claude Weisbuch, and Ram Seshadri “Stable, Heat Conducting Phosphor Composites for High-Power Laser Lighting” *ACS Applied Materials & Interfaces*, **10**, [6], 5673-5681 (2018). [\[DOI\]](#).
  38. John Fuertez, [Gloria Cordoba](#), John McLennan, D. Jack Adams, and **Taylor D. Sparks** “Potential application of developed methanogenic microbial consortia for coal biogasification” *International Journal of Coal Geology*, **188**, 165-180 (2018). [\[DOI\]](#).
  39. Alexander Szendrei\*, **Taylor D. Sparks**, and Anil V. Virkar “Measurement of Ionic Conductivity and Electrode Polarization at Low Temperatures on 8YSZ by a DC Technique” *Journal of the Electrochemical Society*, **164**, [14] F1-F8 (2017). [\[DOI\]](#).
  40. **Taylor D. Sparks** and Leila Ghadbeigi\* “Anisotropic properties of Na-β”-Alumina+ YSZ composite synthesized by vapor phase method” *Journal of Materials Research*, **33** [1], 81-89 (2017). [\[DOI\]](#).
  41. John Fuertez, [Van Nguyen](#), D. Jack Adams, John D. McLennan, Kyu-Bum Han, and **Taylor D. Sparks** “Optimization of Biogenic Methane Production from Coal” *International Journal of Coal Geology*, **183**, (2017) 14-24. [\[DOI\]](#).

42. John Fuertez, Richard Baokye, Austin Gottschalk\*, Jack Adams, John McLennan, and **Taylor D. Sparks** "Developing Methanogenic Microbial Consortia from Diverse Coal Sources and Environments" *Journal of Natural Gas Science & Engineering*, **46**, 637-650 (2017). [\[DOI\]](#).
43. Akira Nagaoka, Kyu-Bum Han\*, Sudhajit Misra, Thomas Wilenski, **Taylor D. Sparks**, Michael A. Scarpulla "Growth and characterization of arsenic doped CdTe single crystals grown by Cd-solvent traveling heater method" *Journal of Crystal Growth*, **467**, 6-11 (2017). [\[DOI\]](#).
44. Anton Oliynyk, Erin Antono, **Taylor D. Sparks**, Leila Ghadbeigi, Michael Gaultois, Bryce Meredig, and Arthur Mar "High-Throughput Machine-Learning-Driven Synthesis of Full-Heusler Compounds" *Chemistry of Materials*, **28**, [20], 7324-7331 (2016). [\[DOI\]](#).
45. Aria M. Tehrani, Leila Ghadbeigi\*, Jakoah Brgoch, and **Taylor D. Sparks** "Balancing mechanical properties and sustainability in the search for superhard materials" *Integrating Materials and Manufacturing Innovation*, **6**, [1], 1-8 (2016). [\[DOI\]](#).
46. Malinda L.C. Buffon, Geneva Laurita, Nisha Verma, Leo Lamontagne, Leila Ghadbeigi\*, Demetrious L. Lloyd, **Taylor D. Sparks**, Tresa M. Pollock, and Ram Seshadri, "Enhancement of Thermoelectric Properties in the Nb--Co--Sn Half-Heusler/Heusler System Through Spontaneous Inclusion of a Coherent Second Phase" *Journal of Applied Physics*, **120**, [7], 075104 (2016). [\[DOI\]](#).
47. Anton Oliynyk, **Taylor D. Sparks**, Michael W. Gaultois, Leila Ghadbeigi\*, and Arthur Mar "Gd<sub>12</sub>Co<sub>5.3</sub>Bi and Gd<sub>12</sub>Co<sub>5</sub>Bi, Crystalline Dopplegänger with Low Thermal Conductivities" *Inorganic Chemistry*, **55**, [13], 6625-6633 (2016). [\[DOI\]](#).
48. Leila Ghadbeigi\*, Zixiao Liu\*, **Taylor D. Sparks**, and Anil V. Virkar "Synthesis of Ion Conducting Sodium Zirconium Gallate + Ytria- Stabilized Zirconia by a Vapor Phase Process" *Journal of the Electrochemical Society*, **163**, [8], A1560-A1565 (2016). [\[DOI\]](#).
49. Michael W. Gaultois, Anton Oliynyk, Arthur Mar, **Taylor D. Sparks**, Gregory Mulholland, and Bryce Meredig "Perspective: Web-based machine learning models for real-time screening of thermoelectric materials properties " *APL Materials*, **4**, [5], 053213 (2016). [\[DOI\]](#). **Selected as cover article.** 
50. Leo Lamontagne, Geneva Laurita, Michael Gaultois, Michael Knight, Leila Ghadbeigi\*, **Taylor D. Sparks**, Craig Brown, and Ram Seshadri "High Thermopower with Metallic Conductivity in p-Type Li-Substituted PbPdO<sub>2</sub>" *Chemistry of Materials*, **28**, [10], 3367-3373 (2016). [\[DOI\]](#).
51. Leila Ghadbeigi\*, Alexander Szendrei\*, Pablo Moreno\*, **Taylor D. Sparks**, and Anil V. Virkar, "Synthesis of Iron-Doped Na-Beta"-Alumina + Ytria-Stabilized Zirconia Composite Electrolytes by a Vapor Phase Process" *Solid State Ionics*, **290**, 77-82 (2016) [\[DOI\]](#).
52. Ram Seshadri and **Taylor D. Sparks** "Perspective: Interactive materials properties databases through aggregation of literature data" invited article, *APL Materials* **4**, [5], 053206 (2016) [\[DOI\]](#).
53. Alexander Szendrei\*, **Taylor D. Sparks**, and Anil V. Virkar "Possible Use of Ytria-Stabilized Zirconia for Potentiometric Measurements at Room Temperature" *Journal of the Electrochemical Society*, **163**, [5] F416-F420 (2016) [\[DOI\]](#).
54. Garrett Meeks, Jason Dalton, **Taylor D. Sparks**, and Dinesh K. Shetty "A functionally-graded carbide in the Ta-C system" *Journal of the American Ceramic Society*, **99**, [2], 392-394 (2016) [\[DOI\]](#).
55. Michael W. Gaultois, Jason E. Douglas, **Taylor D. Sparks**, and Ram Seshadri "Single-step preparation and consolidation of reduced early-transition-metal oxide/metal n-type thermoelectric composites" *AIP Advances*, **5**, [9], 097144, (2015). [\[DOI\]](#).
56. **Taylor D. Sparks**, Anton Oliynyk, Michael W. Gaultois, and Jakoah Brgoch "Datamining our way to the next generation of thermoelectrics," invited Viewpoint Set article, *Scripta Materialia*, **111**, 10-15 (2016). [\[DOI\]](#).
57. Leila Ghadbeigi\*, Jaye K. Harada, Bethany Lettiere, and **Taylor D. Sparks** "Performance and resource considerations of Li-ion battery electrode materials" *Energy and Environmental Science*, **8**, 1640-1650 (2015) [\[DOI\]](#). **Selected as rear cover article.** 
58. Michael W. Gaultois and **Taylor D. Sparks** "How much improvement in thermoelectric performance can come from reducing thermal conductivity?" *Applied Physics Letters*, **104**, 113906 (2014). [\[DOI\]](#)
59. **Taylor D. Sparks**, Moureen C. Kemei, Phillip T. Barton, Ram Seshadri, Eun-Deok Mun, and Vivien Zapf, "Magnetocapacitance as a sensitive probe of magnetostructural changes in NiCr<sub>2</sub>O<sub>4</sub>" *Physical Review B*, **89**, [2] 024405 (2014). [\[DOI\]](#)

60. Michael Gaultois, **Taylor D. Sparks**, Christopher K. H. Borg, Ram Seshadri, William Bonificio, David R. Clarke, "Data -driven review of thermoelectric materials: Performance and resource considerations," *Chemistry of Materials*, **25**, [15] 2911-2920 (2013). [\[DOI\]](#) **Selected as cover article.**
61. **Taylor D. Sparks**, Aleksander Gurlo, David R. Clarke, "Enhanced n-type thermopower in distortion-free  $\text{LiMn}_2\text{O}_4$ ," *Journal of Materials Chemistry*, **22**, [11], 4631-4636 (2012). [\[DOI\]](#)
62. Zhixue Qu, **Taylor D. Sparks**, Ruifen Wu, Chunlei Wan, David R. Clarke and Wei Pan, "Thermal conductivity of the gadolinium calcium silicate apatites: Effect of different point defect types," *Acta Materialia*, **59**, [10], 3841-3850 (2011). [\[DOI\]](#)
63. Wan Chunlei, **Taylor D. Sparks**, Pan Wei, David R. Clarke, "Thermal Conductivity of the Rare-Earth Strontium Aluminates," *Journal of the American Ceramic Society*, **93**, [5], 1457-1460 (2010). [\[DOI\]](#)
64. Wei Liu, Yanyi Liu, Bin Li, **Taylor D. Sparks**, Xi Wei and Wei Pan "Ceria ( $\text{Sm}^{3+}$ ,  $\text{Nd}^{3+}$ )/carbonates composite electrolytes with high electrical conductivity at low temperature" *Composites Science and Technology*, **70**, [1], 181-185 (2010). [\[DOI\]](#)
65. **Taylor D. Sparks**, Paul A. Fuierer, David R. Clarke, "Anisotropic Thermal Diffusivity and Conductivity of La-Doped Strontium Niobate  $\text{Sr}_2\text{Nb}_2\text{O}_7$ ," *Journal of the American Ceramic Society*, **93** [4] 1136-1141 (2010). [\[DOI\]](#)



#### ❖ Patents:

1. "Luminescent paint" provisional patent filed 05/2020.
2. "Fluorapatite-containing structures" provisional patent filed 01/2019.
3. "Spray pyrolysis: a thin film deposition technique for functionally graded films for battery electrodes" provision patent filed 10/31/2017.
4. "Smart proppant platform technology" published July 27 2019 as U.S. Application No.US-2019-0194529-A1.
5. "Encapsulated porous proppant" published June 2 2017 as U.S. Application No. 15/612,659.
6. "Active electrochromic films" published July 20 2017 as U.S. Application No. 62/364,836.

#### ❖ Conference Proceedings: (underlined names are undergraduate co-authors)

1. Danielle N. Beatty and **Taylor D. Sparks** "Differential scanning calorimetry" JoVE Science Education Database. Inactive Collection. JoVE, Cambridge, MA, (2018). [DOI](#).
2. Logan G. Kiefer, Andrew R. Falkowski, and **Taylor D. Sparks** "Electroplating of thin films" JoVE Science Education Database. Inactive Collection. JoVE, Cambridge, MA, (2018). [DOI](#).
3. Amber N. Barron, Ashlea Patterson, and **Taylor D. Sparks** "Hydrogel synthesis" JoVE Science Education Database. Inactive Collection. JoVE, Cambridge, MA, (2018). [DOI](#).
4. Elise S.D. Buki, Danielle N. Beatty, and **Taylor D. Sparks** "Thermal diffusivity and the laser flash method" JoVE Science Education Database. Inactive Collection. JoVE, Cambridge, MA, (2018). [DOI](#).
5. J. Jacob Chavez, Ryan T. Davis, and **Taylor D. Sparks** "Analysis of thermal expansion via dilatometry" JoVE Science Education Database. Inactive Collection. JoVE, Cambridge, MA, (2018). [DOI](#).
6. Kara Ingraham, Jared McCutchen, and **Taylor D. Sparks** "Electrochemical impedance spectroscopy" JoVE Science Education Database. Inactive Collection. JoVE, Cambridge, MA, (2018). [DOI](#).
7. Jeffrey S. Bates and **Taylor D. Sparks** "Teaching Innovation in Materials Science & Engineering" *American Society for Engineering Education*, Rocky Mountain Section Conference, Cedar City, UT, Sep 30-Oct 1 2016. [DOI](#).
8. Benjamin Gilmore, Kyle Roberts, George Fisher, and **Taylor D. Sparks** "Cyclic delamination rates in fiber backed fluoropolymer linings" *International Conference on Plastic Welding and Joining*, AWS New Orleans, April 25-27 2016. [DOI](#).
9. Jeffrey S. Bates, Megan A Adams, and **Taylor D. Sparks** "Investigation of Rice as an Absorbent and Degradable Material for Personal Hygiene Applications" *SM J Eng Sci*, 1(1) 1001 (2016). [DOI](#).
10. Jeffrey S. Bates, Luke R. Whitson, Kelan M. Albertson, Nathan S. Hickerson, Patrick E. Nichols, Bethany E. Larson, and **Taylor D. Sparks** "Molecular imprinted hydrogels in drug delivery applications." MRS 2015 Phoenix, AZ, [DOI](#).

11. Leila Ghadbeigi, [Jaye K. Harada](#), [Bethany Lettiere](#), and **Taylor D. Sparks** "Data-mining approach for battery materials" *2015 IEEE Conference on Technologies for Sustainability (SusTech)* 239-244 (2015). [DOI](#).
12. [Patrick E. Nichols](#), Jeffrey S. Bates, and **Taylor D. Sparks**. "Exploration of Polytetrafluoroethylene as a Potential Material Replacement for Hemodialysis Applications." *MRS Advances*: 1-7 (2016). [DOI](#).

❖ **Materialism Podcast Episodes** (co-authors Taylor D. Sparks and [Andrew Falkowski](#))

1. "Vulcanized Rubber," *Materialism Podcast* August 2020.
2. "Auxetics," *Materialism Podcast* July 2020.
3. "Materials Informatics," *Materialism Podcast* July 2020.
4. "Filtering Out The Bad," *Materialism Podcast* June 2020.
5. "Diamonds Aren't Forever," *Materialism Podcast* June 2020.
6. "Perfecting Polymer Processing," *Materialism Podcast* May 2020.
7. "Surfactants: A Slippery Soap," *Materialism Podcast* April 2020.
8. "A Look Inside Ultrasound," *Materialism Podcast* March 2020.
9. "Self-Healing Rubber," *Materialism Podcast* February 2020.
10. "The Science of Blacksmithing," *Materialism Podcast* January 2020.
11. "Recycling and the Science of Separation," *Materialism Podcast* December 2019.
12. "The Ultimate Construction Material," *Materialism Podcast* November 2019.
13. "Seeing With Electrons," *Materialism Podcast* October 2019.
14. "Materials That Remember," *Materialism Podcast* September 2019.
15. "Yes, Chocolate is a Material," *Materialism Podcast* August 2019.
16. "Gore-Tex: Structuring a Company like a Material," *Materialism Podcast* July 2019.
17. "Hemodialysis and the Birth of Artificial Organs," *Materialism Podcast* June 2019.
18. "Solving Structures with X-Rays," *Materialism Podcast* May 2019.
19. "Turning Heat into Electricity," *Materialism Podcast* April 2019.
20. "Making Materials in a Microwave," *Materialism Podcast* March 2019.
21. "Materials Commercialization: Batch 21," *Materialism Podcast* February 2019.
22. "The History of Steel," *Materialism Podcast*, January 2019.

❖ **Non-Research Publications:**

1. **Taylor D. Sparks** "Materials Informatics: Reducing Trial & Error from the Discovery of New Materials" TEDxSaltLakeCity, September 22 2019, [published online at TED.com](#)
2. **Taylor D. Sparks** "Opinion: Energy leadership scholars program provides unique research opportunities," [published online](#) on Utahpolicy.com, Utahpulse.com, and KSL.com, 10/1/2014.
3. **Taylor D. Sparks** "For stranger things," Harvard University Dudley Review: revenant, Volume 16 (2010).