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Missouri University of Science and Technology  
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### **EDUCATION**

09/2005-05/2009 Ph.D. Mechanical Engineering, University of Michigan, Ann Arbor  
03/1998-02/2000 M.S. Naval Architecture & Ocean Engineering, Seoul National University, Korea  
03/1994-02/1998 B.S. Naval Architecture & Ocean Engineering, Seoul National University, Korea

### **ACADEMIC POSITIONS**

09/2020 – present	Associate Professor	Missouri University of Science & Technology
08/2014 – 08/2020	Assistant Professor	Missouri University of Science & Technology
06/2011 – 08/2014	Assistant Research Scientist	University of Michigan, Ann Arbor
01/2009 – 05/2011	Post-Doctoral Research Fellow	University of Michigan, Ann Arbor

### **WORK EXPERIENCE**

01/2000 – 05/2005	Researcher	Hyundai Heavy Industries, Ulsan, South Korea
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### **HONORS AND AWARDS**

2020-2021	Dean's Scholar, Missouri University of Science and Technology
2020	Faculty Research Award, Missouri University of Science and Technology
2019	Research Acceleration Award, Missouri University of Science and Technology
2018	Faculty Research Award, Missouri University of Science and Technology
2011	Recognition by GM/UM ABCD Institute
2004	Outstanding Research, Hyundai Heavy Industries
1998/1999	Seoul National University Scholarship, Superior Academic Performance
1994-1997	Seoul National University Scholarship, Superior Academic Performance

### **PEER-REVIEWED JOURNAL PUBLICATIONS (total 71 papers)**

Since Missouri S&T (Park advised students underlined, \* indicates the corresponding author)

1. Y. He, L. Wang, B. Zhang, H. Pham, H. Xu, J. Park\*, X. He\*, Atomic-scale insight into the lattice volume plunge of LiCoO<sub>2</sub> upon deep delithiation, Energy Adv., 2023, 2, 103–112
2. D. Chattopadhyay, J. Park, C-S Kim\*, Glass-Based Biodegradable Pressure Sensor Toward Biomechanical Monitoring With a Controllable Lifetime, IEEE Sensors Letters, Vol. 7, No. 2, 2023, 2500304
3. T. P. Plateau, H. Pham, Y. Zhu, M. Leu, J. Park\*, Enabling Ultrathick Electrodes via a Microcasting Process for High Energy and Power Density Lithium-Ion Batteries, Adv. Energy Mater. 2022, 2201353
4. Y. He, M. Zhang, A. Wang, B. Zhang, H. Pham, Q. Hu, L. Sheng, H. Xu, L. Wang, J. Park\*, X. He\*, Regulation of Dendrite-Free Li Plating via Lithiophilic Sites on Lithium-Alloy Surface, ACS Appl. Mater. Interfaces 2022, 14, 33952–33959
5. Y. He, H. Pham, X. Liang, J. Park\*, Impact of ultrathin coating layer on lithium-ion intercalation into particles for lithium-ion batteries, Chemical Engineering Journal, Volume 440, 15 July 2022, 135565
6. M. Sehhat, A.T. Sutton AT, C. Hung, B. Brown, R.J. O'Malley, J. Park, M. Leu\*, Plasma spheroidization of gas-atomized 304L stainless steel powder for laser powder bed fusion process. Materials Science in Additive Manufacturing. 2022 March 18, 1

7. D.M. Ajiboye, J.W. Kimball, R.G. Landers, J. Park\*, An accurate and computationally efficient method for battery capacity fade modeling, *Chemical Engineering Journal* 432 (2022) 134342
8. I. Chen, Y. Liu, X. Yu, W. Everhart, J. Park, Y. Wang, H. Pan\*, “Aerosol printing and flash sintering of conformal conductors on 3D nonplanar surfaces”, *Manufacturing Letters*, In press (2021)
9. S. Sarkar, J. Hoffmann, J. Park\*, “Micro-macroscopic modeling of a lithium-ion battery by considering grain boundaries of active materials”, *Electrochimica Acta* 393 (2021) 139052
10. J. Li, W. Ziehm, J. Kimball, R. Landers, J. Park\*, “Physical-based training data collection approach for data-driven lithium-ion battery state-of-charge prediction”, *Energy and AI* 5 (2021) 100094
11. Y. Lee\*, J. Song, J. Park, “Multi-scale coupled mechanical-electrochemical modeling for study on stress generation and its impact on multi-layered electrodes in lithium-ion batteries”, *Electrochimica Acta* 389 (2021) 138682
12. D.M. Ajiboye, J.W. Kimball, R.G. Landers, J. Park\*, “Computationally efficient battery model for microgrid applications using the Chebyshev spectral method”, *Computers & Chemical Engineering*, Volume 153, October 2021, 107420
13. Y. Gao, H. Yu, P. Sandineni, X. He, A. Choudhury, J. Park, X. Liang\*, “Fe Doping in LiMn1.5Ni0.5O4 by Atomic Layer Deposition Followed by Annealing: Depths and Occupation Sites”, *J. Phys. Chem. C* 2021, 125, 7560–7567
14. B.J.C. Riemann, J. Li, K. Adewuyi, R.G. Landers\*, J. Park\*, “Control-Oriented Modeling of Lithium-Ion Batteries,” *ASME Journal of Dynamic Systems, Measurement, and Control*, February 2021, Vol. 143 / 021002
15. Y. Gao, J. Park, X. Liang\*, “Comprehensive Study of Al- and Zr-Modified LiNi0.8Mn0.1Co0.1O2 through Synergy of Coating and Doping”, *ACS Applied Energy Materials*, *ACS Appl. Energy Mater.* 2020, 3, 8978-8987
16. Y. Zhu, J. Li, M. S. Saleh, H. Pham, T. P. Plateau, Rahul Panat\*, J. Park\*, “Towards high-performance Li-ion batteries via optimized three-dimensional micro-lattice electrode architectures”, *Journal of Power Sources* 476 (2020) 228593
17. Y. He, H. Pham, Y. Gao, R. Patel, S. Sarkar, X. Liang, J. Park\*, “Discovery of an unexpected metal dissolution of thin-coated cathode particles and its Theoretical Explanation”, *Advanced Theory and Simulations*, **3**, 2000002 (2020) **(Cover page)**
18. J. Li, R.G. Landers, J. Park\*, “A comprehensive single-particle-degradation model for battery state-of-health prediction”, *Journal of Power Sources*, 456, 227950 (2020)
19. Y. Gao, X. He, L. Ma, T. Wu, J. Park, X. Liang\*, “Understanding cation doping achieved by atomic layer deposition for high-performance Li-Ion batteries”, *Electrochimica Acta*, 340, 135951 (2020)
20. Y. Zhu, H. Pham, J. Park\*, “A new aspect of the Li diffusion enhancement mechanism of ultra-thin coating layer on electrode materials”, *ACS Applied Materials & Interfaces*, 11, 38719–38726 (2019)
21. X. Yu, Y. Liu, H. Pham, S. Sarkar, B. Ludwig, I. Chen, W. Everhart, J. Park, Y. Wang, H. Pan\*, “Customizable Nonplanar Printing of Lithium-Ion Batteries”, *Advanced Materials Technology*, 4, 1900645 (2019)
22. Y. Gao, Z. Shang, X. He, T. White, J. Park, X. Liang\*, “Cooperating effects of conformal iron oxide (FeOx) ALD coating and post-annealing on Li-Rich layered cathode materials”, *Electrochimica Acta* 318 513-524 (2019)
23. J. Li, Y. Gao, X. Liang, J. Park\*, “Ultra-Thin Coating and Three-Dimensional Electrode Structures to Boosted Thick Electrode Lithium-Ion Battery Performance”, *Batteries & Supercaps.* 2 139-143 (2019)
24. Y. K. Lee, J. Park, W. Lu\*, “A Comprehensive Experimental and Modeling Study on Dissolution in Li-Ion Batteries”, *Journal of The Electrochemical Society*, 166 (8) A1340-A1354 (2019)
25. K. C. R. Kolan, J. Li, S. Roberts, J. A. Semon, J. Park, D. E. Day, M. C. Leu\*, “Near-field electrospinning of a polymer/bioactive glass composite to fabricate 3D biomimetic structures, *International Journal of Bioprinting* 5 (1) 1-6 (2019)

26. R. Panat\*, J. Park\*, M. Sadeq Saleh, J. Li, “3D-printed lattice batteries – Ultralight energy storage for powering the warfighter”, HDIAC Journal **5** (4) 10-14 Winter (2018/2019) (**Invited article from The Homeland Defense and Security Information Analysis Center, HDIAC**)
27. J. Li, X. Liang, R. Panat, J. Park\*, “Enhanced Battery Performance through Three-Dimensional Structured Electrodes: Experimental and Modeling Study”, Journal of The Electrochemical Society 165 (14) A3566-A3573 (2018)
28. Y Gao, J. Park, X. Liang\*, “Synergic Titanium Nitride Coating and Titanium Doping by Atomic Layer Deposition for Stable- and High-Performance Li-Ion Battery”, Journal of The Electrochemical Society 165 (16) A1-A7 (2018)
29. J. Li, X. Liang, Rahul Panat, J. Park\*, “Microstructure-Controlled 3D Electrodes for Lithium-Ion Batteries”, ECS Transactions 85 (13) 369-378 (2018)
30. R. Danaei, T. Varghese, M. Ahmadzadeh, J. McCloy, C. Hollar, M. Sadeq Saleh, J. Park, Y. Zhang, R. Panat\*, “Ultrafast Fabrication of Thermoelectric Films by Pulsed Light Sintering of Colloidal Nanoparticles on Flexible and Rigid Substrates”, Adv. Eng. Mater. 1800800 (2018)
31. M. S. Saleh, J. Li, J. Park\*, R. Panat\*, “3D Printed Hierarchically-Porous Microlattice Electrode Materials for Exceptionally High Specific Capacity and Areal Capacity Lithium-Ion Batteries”, Additive Manufacturing 23 70–78 (2018)
32. X. Wang, Y. He, Y. Liu, J. Park, X. Liang\*, “Atomic Layer Deposited Pt-Co Bimetallic Catalysts for Selective Hydrogenation of alpha, beta-unsaturated Aldehydes to Unsaturated Alcohols”, Journal of Catalysis 366 61–69 (2018)
33. J. Li, X. Liang, F. Liou, J. Park\*, “Macro-/Micro-Controlled 3D Lithium-Ion Batteries via Additive Manufacturing and Electric Field Processing”, Scientific Reports **8** 1846 (2018) (**Top 100 read materials science papers for Scientific Reports in 2018**)
34. J. Li, K. Adewuyi, N. Lotfi, R. G. Landers, J. Park\*, “A single particle model with chemical/mechanical degradation physics for lithium-ion battery State of Health (SOH) estimation”, Applied Energy 212 1178–1190 (2018)
35. M. Al-Yasiri, J. Park\*, “A novel cell design of vanadium redox flow batteries for enhancing energy and power performance”, Applied Energy 222 530-539 (2018)
36. S Sarkar, R. L. Patel, X. Liang, J. Park\*, “Unveiling the Role of CeO<sub>2</sub> Atomic Layer Deposition Coatings on LiMn<sub>2</sub>O<sub>4</sub> Cathode Materials: An Experimental and Theoretical Study”, ACS Appl. Mater. Interfaces 9 30599–30607 (2017)
37. M. Al-Yasiri, J. Park\*, “Study on Channel Geometry of All-Vanadium Redox Flow Batteries”, Journal of The Electrochemical Society 164 (9) A1970-A1982 (2017)
38. Y.K. Lee, J. Park, W. Lu\*, “A Comprehensive Study of Manganese Deposition and Side Reactions in Li-Ion Battery Electrodes”, Journal of The Electrochemical Society 164 (12) A2812-A2822 (2017)
39. J. Li, N. Lotfi, R. G. Landers, J. Park\*, “A Single Particle Model for Lithium-ion Batteries with Electrolyte and Stress-Enhanced Diffusion Physics”, Journal of The Electrochemical Society 164 (4) A874-A883 (2017)
40. N. Lotfi, R. G. Landers\*, J. Li, J. Park, “Reduced Order Electrochemical Model Based SOC Observer with Output Model Uncertainty Estimation”, IEEE Transactions on Control System Technology 25 (4) 1217-1230 (2017)
41. J. Li, M. C. Leu, R. Panat, J. Park\*, “A hybrid three-dimensionally structured electrode for lithium-ion batteries via 3D printing”, Materials and Design 119 417–424 (2017)
42. R. L. Patel, J. Park, X. Liang\*, “Ionic and electronic conductivities of atomic layer deposition thin film coated lithium-ion battery cathode particles”, RSC Adv. 6 98768 (2016)
43. Y. Lee, J. Park, W. Lu\*, “Electronic and Bonding Properties of LiMn<sub>2</sub>O<sub>4</sub> Spinel with Different Surface Orientations and Doping Elements and Their Effects on Manganese Dissolution”, Journal of The Electrochemical Society 163 (7) A1359-A1368 (2016)
44. S. Lee, A. M. Sastry, J. Park\*, “Study on microstructures of electrodes in lithium-ion batteries using variational multi-scale enrichment”, Journal of Power Sources 315 96-110 (2016)

45. J. Park\*, J. Li, W. Lu, A. M. Sastry, "Geometric consideration of nanostructures for energy storage systems", *Journal of Applied Physics* 119 025101 (2016)
46. H. Shin, J. Park, A. M. Sastry, W. Lu\*, "Effects of Fluoroethylene Carbonate (FEC) on Anode and Cathode Interfaces at Elevated Temperatures", *Journal of The Electrochemical Society* 162 (9) A1683-A1692 (2015)
47. R. L. Patel, H. Xie, J. Park, H. Y. Asl, A. Choudhury, X. Liang\*, "Significant Capacity and Cycle-Life Improvement of Lithium-Ion Batteries through Ultrathin Conductive Film Stabilized Cathode Particles", *Advanced Materials Interfaces* 2 (8) 1500046 (2015)
48. H. Shin, J. Park, A. M. Sastry, W. Lu\*, "Degradation of the solid electrolyte interphase induced by the deposition of manganese ions, *Journal of Power Sources* 284 416-427 (2015)
49. H. Shin, J. Park, S. Han, A. M. Sastry, W. Lu\*, "Component-/structure-dependent elasticity of solid electrolyte interphase layer in Li-ion batteries: Experimental and computational studies", *Journal of Power Sources* 277 169-179 (2015)
50. L. Liu, J. Park, X. Lin, A. M. Sastry, W. Lu\*, "A thermal-electrochemical model that gives spatial-dependent growth of solid electrolyte interphase in a Li-ion battery", *Journal of Power Sources* 268 482-490 (2014)
51. S. Lee, J. Park, A. M. Sastry, W. Lu\*, "Molecular Dynamics Simulations of the Traction-Separation Response at the Interface between PVDF Binder and Graphite in the Electrode of Li-Ion Batteries", *Journal of The Electrochemical Society* 161 (9) A1218-A1223 (2014)
52. M. Zhu, J. Park, A. M. Sastry, W. Lu\*, "Numerical Study of Interaction and Aggregation of Non-Spherical Particles in Forming Li-Ion Battery Cathodes", *Journal of The Electrochemical Society* 161 (9) A1247-A1252 (2014)
53. D. H. Song, J. Park, M. A. Philbert, A. M. Sastry, W. Lu\*, "Effects of local pH on the formation and regulation of cristae morphologies", *Physical Review E* 90 022702 (2014)
54. D. H. Song, J. Park\*, M. A. Philbert, A. M. Sastry, W. Lu, "Biophysical significance of the inner mitochondrial membrane structure on the electrochemical potential of mitochondria", *Physical Review E* 88 062723 (2013)
55. X. Lin, J. Park, L. Liu, Y. Lee, A. M. Sastry, W. Lu\*, "A comprehensive capacity fade model and analysis for Li-ion batteries", *Journal of The Electrochemical Society* 160 (10) A1701-A1710 (2013)
56. S.W. Han, J. Park, W. Lu, A. M. Sastry\*, "Numerical study of grain boundary effect on Li<sup>+</sup> effective diffusivity and intercalation-induced stresses in Li-ion battery active materials", *Journal of Power Sources* 240 (15) 155-167 (2013)
57. S. Lee, J. Park, A. M. Sastry, W. Lu\*, "Molecular dynamics simulations of SOC-dependent elasticity of Li<sub>x</sub>Mn<sub>2</sub>O<sub>4</sub> spinels in Li-ion batteries", *Journal of the Electrochemical Society*, 160 (6) A968-A972 (2013)
58. J. Park\*, S. Kalnaus, S. Han, Y.-K. Lee, G. B. Less, N. J. Dudney, C. Daniel, A. M. Sastry, "In situ AFM studies on lithium (de)intercalation-induced morphology changes in Li<sub>x</sub>CoO<sub>2</sub> micro-machined thin film electrodes", *Journal of Power Sources* 222 (15) 417-425 (2013)
59. M. Zhu, J. Park, A. M. Sastry\*, "Fracture analysis of the cathode in Li-Ion batteries: a simulation study", *Journal of the Electrochemical Society* 159 (4) A492-498 (2012)
60. M. Zhu, J. Park, A. M. Sastry\*, "Particle interaction and aggregation in cathode material of Li-ion batteries: A numerical study", *Journal of the Electrochemical Society* 158 (10) A1155-1159 (2011)
61. J. Park, W. Lu, A. M. Sastry\*, "Numerical simulation of stress evolution in lithium manganese dioxide particles due to coupled phase transition and intercalation", *Journal of The Electrochemical Society* 158 (2) A201-A206 (2011)
62. J. Park, J.-H. Seo, G. Plett, W. Lu, A. M. Sastry\*, "Numerical simulation of the effect of the dissolution of LiMn<sub>2</sub>O<sub>4</sub> particles on Li-ion battery performance", *Electrochemical and Solid-State Letters* 14 (2) A14-A18 (2011)
63. J. Park, W. Lu\*, "Self-assembly of nanoparticles into heterogeneous structures with gradient material properties", *Physical Review E* 83 031402 (2011)

64. J. Park, X.-Q. Feng, W. Lu\*, "Instability of electrowetting on a dielectric substrate", *Journal of Applied Physics* 109 034309 (2011)
65. J.-H. Seo, J. Park, G. Plett, A. M. Sastry\*, "Gas-evolution induced volume fraction changes and their effect on the performance degradation of Li-ion batteries", *Electrochemical Solid-State Letters* 13 (9) A135-A137 (2010)
66. J. Park, W. Lu\*, "Control morphology of nanostructures with electric field", *Applied Physics Letters* 95 073110 (2009)
67. J. Park, W. Lu\*, "Interaction of nanoparticles with lipid layers", *Physical Review E* 80 021607 (2009)
68. J. Park, W. Lu\*, "Self-assembly of functionally gradient nanoparticle structures", *Applied Physics Letters* 93 243109 (2008)
69. J. Park, W. Lu\*, "Electric processing of core-shell nanoparticles", *Journal of Computational and Theoretical Nanoscience* 5 1-7 (2008)
70. J. Park, W. Lu\*, "Orientation of core-shell nanoparticles in an electric field", *Applied Physics Letters* **91** 053113 (2007) (**Selected by Virtual Journal of Nanoscale Science & Technology, Reported in Nanotech News**)
71. Y.-H. Choi, G.-C. Shin, J.-S. Yoo, J.-S. Kim, W.-H. Joo, Y.-H. Kim, J. Park, S.-M. Choi, W.-S. Kim\*, "Numerical analysis and experimental verification for target strength of submerged body", *Journal of Ocean Engineering and Technology* 19 (1) 64-70 (2005)

#### **CONFERENCE PAPERS WITH A PRESENTATION (total 15)**

**Since Missouri S&T** (Park advised students underlined, \* indicates the corresponding author)

1. Y. Zhu, T. Plateau, B. Riemann, R. Landers, J. Park\*, "A control oriented comprehensive degradation model for battery energy storage system life prediction", Modeling, Estimation and Control Conference (MECC), October 2021
2. K. C. R. Kolan, J. Li, J. Park, J. A. Semon, M. C. Leu, "Near-Field Electrospinning of a Polymer Bioactive Glass Composite", 29th Annual International Solid Freeform Fabrication Symposium - An Additive Manufacturing Conference, August 13-15, 2018
3. P. Jain, J. Mueller, J. Park, R. Landers, J. Kimball\*, "Battery Optimization in Microgrids using Markov Decision Process Integrated with Load and Solar Forecasting", IEEE 9th International Symposium on Power Electronics for Distributed Generation, June 25-28, 2018
4. X. Yu, I. Chen, S. Sarkar, J. Park, H. Pan\*, "Direct Aerosol Printing of Lithium-ion Batteries", IMAPS 50th International Symposium on Microelectronics, October 10-12, 2017
5. S. Sarkar, J. Park\*, "A Comprehensive Understanding on How Ultrathin Coating Layers on Active Particles Enhance Battery Performance Significantly", 231st ECS Meeting, May 28-Jun. 2, 2017
6. J. Li, M. Leu, J. Park\*, "3D Printed Hybrid Electrodes for Lithium-Ion Batteries" 231st ECS Meeting, May 28-June 2, 2017
7. J. Li, N. Lofti, R. Lander, J. Park\*, "A Reduced-Order Battery Degradation Model for Battery Management Systems", 231st ECS Meeting, May 28-Jun. 2, 2017
8. N. Lotfi, J. Li, R. G. Landers\*, J. Park, "Li-Ion Battery State of Estimation Based on an Improved Single Particle Model," American Control Conference, Seattle, Washington, May 24-26, 2017
9. J. Park\*, S. Lee, J. Hoffmann, A. M. Sastry, "Study of the effect of electrode microstructures on battery performance", Proceedings of the International Mechanical Engineering Congress & Exposition, 2015 IMECE, Houston, Texas, USA, November 13-19, 2015
10. N. Lotfi, R.G. Landers\*, J. Li, J. Park, "Electrochemical model-based adaptive estimation of li-ion battery state of charge", Proceedings of the ASME 2015 Dynamic Systems and Control Conference, DSCC, Columbus, Ohio, USA, October 28-30, 2015
11. Y. H. Choi, G. C. Shin, J. S. Yoo, J. S. Kim, W. H. Joo, Y. H. Kim, J. Park, S.M. Choi, W.S. Kim\*, "Numerical Modeling and Experimental Verification for Target Strength of Submerged Objects", Advanced seminar of Marine weapon, 5, 171-176, Jinhae, Korea, June 03-04, 2004
12. R. Fischer, L. Boroditsky, W. H. Joo\*, J. Park, "Verification of a hybrid model for shipboard noise predictions", Internoise, 421-1427, Jeju, Korea, August 25-28, 2003

13. D. H. Kim\*, J. Park, "A noise control of a Ro-Ro passenger ferry", KSNVE, 738-741, Mokpo, Korea, May 21-23, 2003
14. J. Park, D. H. Kim\*, "A study on the prediction and database program of ship noise", KSNVE, 149-154, Busan, Korea, May 17-18, 2001
15. J. Park, S. Y. Hong\*, "Wave scattering and power flow analysis in the jointed beam-plate structure", KSNVE, 481-490, Muju, Korea, May 13-14, 1999

## **PRESENTATION (total 107)**

### **Invited Talk**

(Park advised students underlined)

1. T.P. Plateau, H. Pham, Y. Zhu, J. Park, Ultra-Thick Electrodes for High Energy and Power Density Lithium-ion Batteries, TMS 2023 Annual Meeting & Exhibition, San Diego, California, March 19-23, 2023
2. J. Park, "State-of-the-art in advanced battery technologies", Hyundai Heavy Industries, July 2022
3. J. Park, "Multiphysics-based battery modeling", 19<sup>th</sup> U.S. National Congress on Theoretical and Applied Mechanics, UT Austin TX, June 2022
4. J. Park, "Advanced battery materials, structure, and control for better performance and safety", Battery Safety Workshop, Missouri University of Science and Technology, June 2022
5. J. Park, "Structured Electrode Manufacturing for Lithium-ion Batteries", Center for Infrastructure Engineering Studies, Missouri University of Science and Technology, October 28, 2021
6. J. Park, "Heterogeneous Integration for Energy Storage Devices", Indiana University–Purdue University Indianapolis, October 2020
7. J. Park, "Introduction on Energy Storage Systems", Electromagnetic Compatibility Center, March 2020
8. J. Park, "Interface and Microstructure of Energy Storage Devices", Korean Society of Mechanical Engineers (KSME), July 2019
9. J. Park, "Advanced Battery Modeling and Simulation", SK Innovation, June 22, 2018
10. J. Park, "Advanced Battery Systems", Samsung, June 20, 2018
11. J. Li, X. Liang, R. Panat, J. Park, "3D Structured Electrodes for Lithium-Ion Batteries", Collaborative Conference on Materials Research (CCMR), Incheon, South Korea, June 24-28, 2018
12. S. Sarkar, Y. He, R. Patel, X. Liang, J. Park, "Unveiling the role of CeO<sub>2</sub> atomic layer deposition coating layer on LiMn<sub>2</sub>O<sub>4</sub> cathode material: experimental and theoretical study", Collaborative Conference on Materials Research (CCMR) 2017, Jeju island, South Korea, June 26-30, 2017
13. J. Li, J. Park, "Hybrid three-dimensional electrodes based on additive manufacturing" Sustainable Industrial Processing Summit & Exhibition, October 22-27, 2017
14. J. Park, "Advanced Energy Materials and Systems", Ameren, MO, January 6, 2017
15. J. Li, N. Lotfi, R. Landers, and J. Park, Advanced Single Particle Capacity Fade Model for Lithium-ion Battery, EaglePicher, July 22, 2016
16. J. Park, "Why do lithium-ion batteries degrade?", Chemical and Biochemical Engineering Graduate Seminar, Missouri University of Science and Technology, Rolla, MO, January, 26, 2016
17. J. Park, "Degradation in Lithium-ion Batteries", University of Missouri, Columbia, MO, February 10, 2015
18. J. Park, "Research Activities of the Missouri S&T Advanced Energy Materials and Systems Laboratory", EaglePicher, Joplin, MO, February 6, 2015
19. J. Park, W. Lu, and A.M. Sastry, "Numerical Simulation of Phase Transition Induced Stresses in Lithium Manganese Dioxide Particles", The 15th International Meeting on Lithium Batteries - IMLB 2010, Montreal, Quebec, Canada, June 27, 2010

### **Conference Presentation**

(Park advised students underlined, \* indicates the corresponding author)

20. T. P. Plateau, H. Pham, Y. Zhu, J. Park\*, "Ultra-Thick Electrodes Utilizing Short Diffusion Path Via Novel Micro-Casting Process for Lithium-Ion Batteries ", 242nd ECS Meeting, Atlanta, GA, Oct 10-14, 2022.
21. S. Zuluaga, T. P. Plateau, J. Park\*, "Soybean-Derived Printed Graphene Structures via Aerosol Jet Printing Process", The 33rd Annual International Solid Freeform Fabrication Symposium - An Additive Manufacturing Conference, July 25-27, 2022, Hilton Austin Hotel Austin, Texas, USA
22. F. Sepulveda, H. Pham, T. Turk, M. Leu, J. Park\*, "Metal Additive Manufacturing for Advanced Materials by Laser Foil Printing", The 33rd Annual International Solid Freeform Fabrication Symposium - An Additive Manufacturing Conference, July 25-27, 2022, Hilton Austin Hotel Austin, Texas, USA
23. M. Escobar, T. Turk, J. Park, M. Leu\*, "Additive Manufacturing of Embedded Sensors with Laser Foil Printing Method", The 33rd Annual International Solid Freeform Fabrication Symposium - An Additive Manufacturing Conference, July 25-27, 2022, Hilton Austin Hotel Austin, Texas, USA
24. H. Pham, S. Sarkar, J. Park\*, "Stability Enhancement of PbO-based Anodes through Facile Encapsulation in Carbon Nanofibers for Li-ion Batteries", 239th ECS Meeting and the 18th International Meeting on Chemical Sensors (IMCS), 5/30-6/3/2021
25. T. Plateau, H. Pham, S. Sarkar, J. Park, "Inter-Bonded Carbon Nanofibers Based Anode for High Areal Capacity Lithium-Ion Battery", 239th ECS Meeting and the 18th International Meeting on Chemical Sensors (IMCS), 5/30-6/3/2021
26. J. Li, Z. Yaqi, H. Pham, X. Liang, R. Panat, J. Park\*, "Multiscale controlled three-dimensional electrodes for lithium ion batteries", TMS, San Diego, CA, Feb 23-27, 2020
27. M. Saleh, J. Li, J. Park, and R. Panat\*, "3D Printed Lithium Ion Batteries and Other Functional Devices", TMS, San Diego, CA, Feb 23-27, 2020
28. H. Pham, J. Park, A unique encapsulation of insoluble powders into nanofibers for electrode composites, 2019 MRS Fall Meeting, Boston, MA, December 1-6, 2019
29. Y. Zhu, H. Pham, Y. Gao, Y. He, X. Liang, J. Park\*, New insights into how ultra-thin coatings improve battery performance, 2019 MRS Fall Meeting, Boston, MA, December 1-6, 2019
30. D. M. Ajiboye, J.W. Kimball, R.G. Landers, J. Park\*, "A highly efficient computational model of energy storage systems for microgrid applications", 235th ECS Meeting, Dallas, TX, May 26-30, 2019
31. Y. He, S. Sarkar, X. Liang, J. Park\*, "A discovery of an unexpected metal dissolution of thin-coated cathode particles and its theoretical explanation". 235th ECS Meeting, Dallas, TX, May 26-30, 2019
32. Y. Zhu, J. Li, M. Saleh, R. Panat, J. Park\*, "Simulation of Aerosol Jet 3D Printed Electrodes for Lithium-ion Batteries", 235th ECS Meeting, Dallas, TX, May 26-30, 2019
33. T. P. Plateau, S. Sarkar, H. Pham, J. Park\*, "Ni-wrapped carbon nanofibers for lithium ion batteries", 235th ECS Meeting, Dallas, TX, May 26-30, 2019
34. H. Pham, S. Sarkar, J. Park\*, "Lead-carbon nanofiber-based anode for high performance li-ion battery", 235th ECS Meeting, Dallas, TX, May 26-30, 2019
35. H. Pham, M. Al-Yasiri, T. Plateau, J. Smith, I. Wolf, J. Park\*, "A novel cell design for enhancing energy and power performance of flow batteries", 235th ECS Meeting, Dallas, TX, May 26-30, 2019
36. Y. He, Y. Gao, X. Liang, J. Park\*, "Impact of thin coating layers on metal dissolution for battery applications", 2019 MRS spring meeting & exhibition, Phoenix, Arizona, April 22-26, 2019
37. J. Li, J. Park\*, "Multiscale-Controlled 3D Electrodes for Lithium-Ion Batteries", 2018 MRS Fall meeting & exhibition, Boston, MA, November 25-30, 2018
38. J. Li, X. Liang, R. Panat, J. Park\*, "3D Structured Electrodes for Lithium-Ion Batteries", Collaborative Conference on Materials Research (CCMR), Incheon, South Korea, June 24-28, 2018
39. J. Li, X. Liang, J. Park\*, "Microstructure-Controlled 3D Electrodes for Lithium-Ion Batteries", 233rd ECS MEETING, Seattle, WA, May 13-17, 2018
40. J. Li, X. Liang, R. Panat, J. Park\*, "Microstructure-Controlled 3D Electrodes for Lithium-Ion Batteries", 233rd ECS Meeting, May 13-17, 2018
41. J. Li, J. Park\*, "Hybrid three-dimensional electrodes based on additive manufacturing" Sustainable

- Industrial Processing Summit & Exhibition, October 22-27, 2017
42. S. Sarkar, Rajankumar L. Patel, X. Liang, J. Park\*, “Unveiling the role of CeO<sub>2</sub> atomic layer deposition coating layer on LiMn<sub>2</sub>O<sub>4</sub> cathode material: experimental and theoretical study”, Collaborative Conference on Materials Research (CCMR), June 26-30, 2017
  43. Y. He, J. Park\*, “First-Principles Study of Ultrathin Coating Layer on Cathode Particles in Lithium Ion Batteries”, 231st ECS Meeting, May 28 - June 2, 2017
  44. M. Al-Yasiri, J. Park\*, “A New Enclosed Design for Vanadium Redox Flow Battery Cells”, 231st ECS Meeting, May 28 - June 2, 2017
  45. J. Hoffmann, J. Park\*, “Micro-Macroscopic Modeling of a Lithium-Ion Cell By Considering Grain Boundaries of Active Materials”, 231st ECS Meeting, May 28 - June 2, 2017
  46. S. Sarkar, Y. He, R. Patel, X. Liang, J. Park\*, “Unveiling the role of CeO<sub>2</sub> atomic layer deposition coating layer on LiMn<sub>2</sub>O<sub>4</sub> cathode material: experimental and theoretical study”, Collaborative Conference on Materials Research (CCMR) Jeju island, South Korea, June 26-30, 2017
  47. S. Sarka, R. L. Patel, X. Liang, J. Park\*, “Impact of ultrathin coating on lithium-ion battery cathode materials”, Defense Innovation Summit, Austin, Texas, November 29 - December 1, 2016
  48. J. Li, J. Park\*, “A Three-Dimensionally Structured Hybrid Electrodes for Energy Storage Devices”, Defense Innovation Summit, Austin, Texas, November 29 - December 1, 2016
  49. A. Leong, S. Sarkar, and J. Park\*, “Fabrication of electrospun nanofibrous SPEEK membranes for use in Vanadium Flow Batteries”, Solid Freeform Fabrication Symposium, Austin TX, August 7-9, 2016
  50. J. Park\*, S. Lee, J. Hoffmann, A. M. Sastry, “Study of the effect of electrode microstructures on battery performance”, Proceedings of the International Mechanical Engineering Congress & Exposition, 2015 IMECE, Houston, Texas, USA, November 13-19, 2015
  51. J. Park\*, H. Shin, J. Li, “Mechanical Stability of the Solid Electrolyte Interphase Layer in Lithium-ion Batteries”, ASME 2015 Applied Mechanics and Materials conference, Seattle, Washington, June 29 - July 1, 2015
  52. H. Shin, J. Park, W. Lu, “Interfacial Chemistry and Mechanics of Fluoroethylene Carbonate (FEC)-Derived Electrode/Electrolyte Interfaces”, 18th International Meeting on Lithium Batteries, Chicago, Illinois, USA, June 19-24, 2016
  53. H. Shin, W. Lu, J. Park, “Mechanical Properties of Solid Electrolyte interphase Layer in Li-Ion Batteries: Experimental and Computational studies”, 18th International Meeting on Lithium Batteries, Chicago, Illinois, USA, June 19-24, 2016
  54. J. Park, M. Zhu, Y.-K. Lee, S. Han, H. Shin, S. Lee, W. Lu, and A.M. Sastry, “Degradation modeling of Li-ion battery cells” 16th International Meeting on Lithium Batteries, Jeju, Korea, June 17-22, 2012
  55. H. Shin, J. Park, W. Lu, and A.M. Sastry, “The effects of temperature on the formation/growth of the SEI layer near the anode surface” 16th International Meeting on Lithium Batteries, Jeju, Korea, June 17-22, 2012
  56. X. Lin, J. Park, and W. Lu, “The impact of fracture on Li-ion batteries”, The 17th U. S. National Congress on Theoretical and Applied Mechanics, Michigan State University, East Lansing, MI, June 15-20, 2014
  57. J. Park, Y.-K. Lee, X. Lin, A.M. Sastry, and W. Lu, “Numerical and experimental study of temperature distribution on a large-format cell”, Battery Congress 2013, Michigan State University, MI, April 15-16, 2013
  58. S. Han, J. Park, A.M. Sastry, and W. Lu, “A numerical study of grain boundary effect on Li<sup>+</sup> diffusivity and diffusion-induced stress in Li-ion battery active materials”, Battery Congress 2013, Michigan State University, MI, April 15-16, 2013
  59. M. Zhu, J. Park, and A.M. Sastry, “Fracture analysis of the cathode in Li-ion batteries: a simulation study”, 221st ECS Meeting, Seattle, WA, May 06-10, 2012
  60. Y.-K. Lee, J. Park, W. Lu, and A.M. Sastry, “Study of manganese dissolution and deposition in Li-ion battery electrodes by ICP-OES”, 221st ECS Meeting, Seattle, WA, May 06-10, 2012



61. S. Han, J. Park, W. Lu, and A.M. Sastry, "A numerical study of grain boundary effect on Li<sup>+</sup> diffusivity and diffusion-induced stress in Li-ion battery active materials", 221st ECS Meeting, Seattle, WA, May 06-10, 2012
62. S. Lee, J. Park, and A.M. Sastry, "Variational multi-scale enrichment for electrochemical Li-ion battery cell", 221st ECS Meeting, Seattle, WA, May 06-10, 2012
63. J. Park, W. Lu, and A.M. Sastry, "Stress evolution in lithium manganese oxide particles due to coupled phase transition and intercalation", 48th Annual Technical Conference of Society of Engineering Sciences, Evanston, IL, October 12-14, 2011
64. J. Park, W. Lu, and A.M. Sastry, "Stress evolution in lithium manganese oxide particles", ASME 2011 International Mechanical Engineering Congress & Exposition, Denver, CO, November 11-17, 2011
65. M. Zhu, J. Park, and A.M. Sastry, "Fracture mechanisms and aggregation phenomena in electrode materials", SAE 2011 World Congress, Detroit, MI, April 12-14, 2011
66. J. Park, W. Lu, and A.M. Sastry "Stress evolution due to phase boundary movement and intercalation in LMO particles of Li-ion batteries", SAE 2011 World Congress, Detroit, MI, April 12-14, 2011
67. J. Park, J.-H. Seo, W. Lu, G. Plett, and A.M. Sastry, "The effect of dissolution of lithium manganese oxide particles on lithium-ion battery performance," 218th ECS Conference, Las Vegas, NV, October 10-15, 2010
68. S. Kalnaus, J. Park, S. Han, Y.-K. Lee, G. Less, C. Daniel, A.M. Sastry, and N. Dudney, "Investigation of lithium insertion/extraction induced morphology changes in micromachined specimens of Li-Ion battery cathode material", 218th ECS Conference, Las Vegas, NV, October 10-15, 2010
69. J. Park and W. Lu, "Interaction of dendrimers with lipid bilayers", ASME International Mechanical Engineering Congress, Lake Buena Vista, FL, November 12-18, 2009
70. J. Park and W. Lu "Control wettability and morphology with electric field", ASME International Mechanical Engineering Congress, Lake Buena Vista, FL, November 12-18, 2009
71. J. Park and W. Lu, "Interaction and self-assembly of nanoparticles for biomedical, nanodevice, and material applications", NSF-Civil, Mechanical and Manufacturing Conference, Honolulu, HI, June 22-25, 2009
72. J. Park and W. Lu, "Morphology control of core-shell nanoparticles in a matrix with electric field", Material Research Society Conference, Boston, MA, November 26-30, 2007
73. B. H. Yoo, J. Park, W. H. Joo and K. D. Lee, "Numerical Analysis and Practical Proposition to Reduce Underwater Radiated Noise from Submerged Hull", Internoise, Prague, Czech Republic, April 22-25, 2004
74. J. Park, Jong-Gug Bae, and Jin-Hwa Park, "Vibration control for local structures using damped dynamic absorber", ICSV, Stockholm, Sweden (July 07-10, 2003)
75. J. Park, Wonho Joo, and Donghae Kim, "A study on the prediction system for underwater radiated noise of a naval ship", UDT, Jeju, South Korea (October 08-10, 2002)

#### **Other Technical Presentation**

76. J. King, T. Plateau, J. Park\*, "Flexible Nickel Zinc Battery", 2023 MOCAP Annual Summit
77. H. Pham, J. Park\*, "PbO-based Carbon Nanofiber Electrodes For High Performance Lithium-ion And Lead-acid Batteries", 2022 MOCAP Annual Summit
78. T. Plateau, J. Park, "Ultra-Thick Electrodes via Novel Micro-Casting Process for Large Scale Production", MOCAP Annual Summit 2023
79. A. Reed, T. Plateau, H. Pham, J. Park\*, "A Cost Effective Vanadium Redox Flow Battery with an Embedded Cell Design", MOCAP Annual Summit 2022
80. T. Plateau, J. Park\*, "Fe<sub>2</sub>O<sub>3</sub>-Doped Graphene Oxide/ Carbon Nanofibers for High Performance Flexible Electrodes for Lithium-ion Batteries", MOCAP Annual Summit 2022
81. T. Plateau, J. Park\*, "Multifunctional Flexible Carbon Nanofibers via Selective Laser Carbonization", 17th Annual ISC Poster Presentation, November, 2022

82. H. Pham, G. Boyer, C. Sadler, W. Stoecker, C. Kim, J. Park\*, “On-demand Multidrug Delivery via Individualized Three-Dimensional Wound Dressings”, 2022 CBR Symposium and Poster Session, CBR-SPS 2022
83. G. Boyer, H. Pham, J. Park\*, “Laser Processing of Ultra-Thick Electrodes for Lithium-ion Batteries”, MOCAP Annual Summit, MOCAP-AS 2022
84. G. Boyer, H. Pham, T. Plateau, J. Park\*, “Laser Processing for Three-Dimensional (3D) Lithium-ion Batteries”, Distinguished Undergraduate Research Fellowship Poster Presentation, DURF-PP 2022
85. T. P. Plateau, J. Park\*, “A Highly Conductive and Well-Percolated SiO<sub>2</sub>-based Anode for Lithium-ion Batteries via Rapid Flash Sintering Manufacturing”, Proceedings of the 16th Annual ISC Graduate Research Symposium, ISC-GRS 2022.
86. J. Sutton, T. P. Plateau, J. Park\*, “Development of Lithium-Ion Battery Configurations for Low Temperature Applications”, Proceedings of the 2022 NASA-Missouri Space Grant Consortium, NASA-MOSGC 2022.
87. T. P. Plateau, J. Park\*, “Fe<sub>2</sub>O<sub>3</sub>-Doped Graphene Oxide/ Carbon Nanofibers for High Performance Flexible Electrodes for Lithium-ion Batteries”, Proceedings of the MOCAP Annual Summit (Poster), Springfield, Missouri, 2022.
88. E. Olugbade, A. Reed, J. Park\*, “Selective Laser Melting of 304 Stainless Steel Nanoparticles: a molecular dynamics study”, Proceedings of the Council of Graduate Studies: Research Fair, Rolla, Missouri, 2021
89. G. Boyer, H. Pham, J. Park\*, “Enabling Ultra-thick Electrode for Lithium-ion Batteries”, Distinguished Undergraduate Research Fellowship Conference, DURF-C 2021
90. K. O'Boyle, R. Landers, J. Park\*, “State of Health Estimations for Repurposed Lithium-Ion Batteries”, Distinguished Undergraduate Research Fellowship Conference, DURF-C 2021
91. T. Plateau, A. Reed, M. Leu, J. Park\*, “A Computational Analysis of Defect Generation in Thick Powder Layers for High Build-Rate Laser Powder Bed Fusion Process”, Proceedings of the 14th Annual ISC Graduate Research Symposium, ISC-GRS 2021
92. T. P. Plateau, H. Pham, Y. Zhu, J. Park\*, “Ultra-thick Electrodes for High Energy Density Lithium-ion Batteries”, Proceedings of the 16th Annual ISC Graduate Poster Presentation, ISC- 2021.
93. Y. Zhu, M. Leu, J. Park\*, Multi-physical Modeling of Selective Laser Melting, Proceedings of the 13th Annual ISC Graduate Research Symposium, ISC-GRS 2019
94. H. Pham, T. Plateau, J. Smith, R. Landers, J. Park\*, “A novel cell design of alkaline-based zinc-iodide flow battery for enhancing energy and power performance”, Proceedings of the 13th Annual ISC Graduate Research Symposium, ISC-GRS 2019
95. T. P. Plateau, H. Pham, J. Park\*, “A Novel Cell Design of Alkaline-Based Zinc -Iodide Flow Battery for Enhancing Energy and Power Performance”, Proceedings of the 13th Annual ISC Graduate Research Symposium, ISC-GRS 2019.
96. H. Pham, E. Kinzel, C. Kim, C. Spencer, J. Park\*, “Multifunctional CuS-nanoparticle Embedded Catheter for Multimodal Cancer Therapy”, Ozark Biomedical Initiative Research Symposium (OBIRS), August 2019
97. H. Pham, E. Kinzel, C. Kim, C. Spencer, J. Park\*, “Multimodal Cancer Therapy via CuS-Nanoparticle Embedded Catheter”, Ozark Biomedical Initiative Research Symposium (OBIRS), August 2018
98. K. Marma, R. Lander, J. Park\*, “Development of a Distributive Flow Battery for Transport Systems”, ISC Graduate Research Symposium, 2018
99. S. Sarkar and J. Park\*, “Understanding Degradation Mechanism of Lead Acid Batteries and Their Hybrid Systems”, Missouri S&T Microgrid Industrial Consortium Meeting Innovative, January 12, 2017
100. S. Sarkar, J. Park\*, “Impact of Ultrathin CeO<sub>2</sub> coating on Lithium Ion Battery Cathode Particles”, Graduate Research Showcase, April 10, 2017, Missouri S&T, Rolla, USA (Poster)
101. S. Sarkar, J. Park\*, “Investigation into Degradation Mechanism of Lead Acid Batteries and Finding Its New Opportunities in Li ion Batteries”, Industry Day, September 25, 2017, Missouri S&T, Rolla,

USA

102. S. Sarkar, J Park\*, “Understanding Degradation Mechanism of Lead Acid Batteries and Their Hybrid Systems”, Microgrid Industrial Consortium, January 12, 2017, Missouri S&T, Rolla, USA
103. D. Yoon, S. Sarkar, J Park\*, “High Performance Li ion batteries using Lithium Nickel Manganese Oxide Nanofibers”, July 21, 2016, Summer Research Program, Missouri S&T, Rolla, USA  
J. Park, “Research Activities in Advanced Energy Materials and Systems Laboratory, Ameren, MO, January 6, 2017
104. J. Li, N. Lotfi, R. Landers, and J. Park, “Advanced Single Particle Capacity Fade Model for Lithium-ion Battery”, July 22/2016, EaglePicher
105. J. Park, “Why do lithium-ion batteries degrade?”, Chemical and Biochemical Engineering Graduate Seminar, Missouri University of Science and Technology, Rolla, MO, January, 26, 2016
106. J. Park, “Degradation in Lithium-ion Batteries”, University of Missouri, Columbia, MO, February 10, 2015
107. J. Park, “Research Activities of the Missouri S&T Advanced Energy Materials and Systems Laboratory”, EaglePicher, Joplin, MO, February 6, 2015

### **Student Awards**

1. Jacob King, 1st place in the MOCAP Annual Summit, 2023
2. Tazdik Plateau, 2nd Place, Virtual Poster Competition, Council of Graduate Students, 2023
3. Tazdik Plateau, 1st place, Poster showcase, MOCAP Annual Summit, 2023
4. Gracie Boyer, 1st place in the MOCAP Annual Summit, 2022
5. Tazdik Plateau, 2nd place, best poster presentation, 17th Annual ISC Poster Presentation, 2022
6. Hiep Pham and Gracie Boyer, 2nd place in the CBR Symposium and Poster Session, 2022
7. Tazdik Plateau, People’s Choice Award, S&T’s seventh annual Three Minute Thesis (3MT®) competition, 2022
8. Gracie Boyer, 1st place in the Distinguished Undergraduate Research Fellowship Poster Presentation, 2022
9. Derrick Barger, 1st place in the 16th Annual Undergraduate Research Conference, 2021
10. Tazdik Plateau, 2nd place in the ISC Graduate Research Symposium, 2021
11. Susmita Sarkar, Secretary of ECS, Missouri S&T Student Chapter, October 2017
12. Susmita Sarkar, 2nd place at Council of Graduate Students Graduate Research Showcase of Missouri S&T, April 2017
13. Yufang He, 1st place at Council of Graduate Students Graduate Research Showcase of Missouri S&T, April 2017
14. Hiep Pham, Travel Grant Award from Council of Graduate Students (CGS) of Missouri S&T, Spring 2017
15. Susmita Sarkar, Travel Grant Award from Council of Graduate Students (CGS) of Missouri S&T, Spring 2017

### **BOOK CHAPTER:**

1. Energetic Materials: Advanced Processing Technologies for Next-Generation Materials, CRC Press, Chapter 9: Mixing, Coating, and Shaping, J. Park, H. Pan, M. J. Mezger, S. M. Nicolich, J. M. Centrella, F. T. Fisher, N. Boz, M. Malik, S. Aktas, J. He, D. M. Kalyon
2. Advanced Materials for Battery Separators, Chapter 13: Redox Flow Batteries, J. Lie, M. Al-Yasiri, H. Pham, J. Park (under review)

### **PATENTS:**

#### **10 technology transfer activities**

Issued

1. Controlling structures of battery electrodes, Patent No. 10,804,524
2. Cell for Flow Battery, Patent No. 11,031,619

3. Distributed Energy Storage System, Patent No. 10,637,221
4. Fuel Cell Having Corrugated Membrane Electrode Assembly, Patent No. 11,380,926
5. Cell for Flow Battery, Patent No. 11,611,098

Published

1. 21MST005 and 21MST020: Multi-cell flow battery and fuel cell assemblies (no. 17/506,123)
2. 20MST002-PRV: Oxidation Polymerization Additive Manufacturing (no. US17/034,586)
3. 20MST002: Conductive polymer (US-2021-0094226-A1)
4. 19MST009: Structured electrodes for fuel cells (US-2021-0050612-A1)
5. 19MST008: 3-Dimensional lattice batteries via AM (joint w/ CMU) (Prov #: 62/766,151; Utility Application #: 16/593,622 – 2020/0112030A1)

## **RESEARCH GRANT FUNDING**

### **External Funding**

1. “Nanofiber Zinc Oxide Antioxidant Wound Dressing”, Ozark Biomedical Initiative, PI: William Stoecker, co-PI: J. Park (33), \$15,000, Jul. 2022 – Jun. 2023
2. “Center of All-Solid-State Batteries for a Clean Energy Society”, NSF, PI: J. Park, \$317,009, Jan. 2023-Dec. 2025
3. “CEMC Membership Agreement for META-PIM, META, PI: C. Hwang, co-PI: J. Park (50), \$80,000, Feb. 2023- Jan. 2024
4. “Materials Research & Embedded Sensing via Laser Foil Printing Additive Manufacturing”, Triad National Security LLC, PI: M. Leu, co-PI: J. Park (20), \$70,000, Jun. 2022-May. 2023
5. “Additive Materials Evaluations”, Honeywell Federal Manufacturing & Technologies, PI: M. Leu, co-PI: J. Park (40), \$170,804, Jun. 2022-Aug. 2023
6. “GAANN: Doctoral Research and Training in Mechatronics”, Department of Education, PI: D. Bristow, co-PI: J. Park (10), \$1,213,584, Oct. 2021-Sep. 2024
7. “Studying cellphone Tx desense due to loose metal contact”, Google LLC, PI: C. Hwang (65), co-PI: J. Park (35), \$260,000, March 23, 2021 - April 4, 2023
8. “Understanding the Physics of Laser Powder Bed Fusion for Process Productivity and Part Quality Improvement”, Honeywell Federal Manufacturing & Technologies, PI: J. Park (80), co-PI: M. Leu (20), \$50,000, Jun. 2021-Aug. 2021. (This is for a seed grant for PDRD targeting 2022)
9. “EAGER: SARE: Security and Functionality of Energy Storage Devices from an External Electromagnetic Attack”, NSF-ECCS, PI: J. Park (50), co-PI: C. Hwang (50), \$300,000, Sep. 2020 – Aug. 2023
10. “Multiscale Manufacturing for Advanced Energy Storage Devices”, NSF-CMMI, PI: J. Park (100), \$337,884, Sep. 2019 – Aug. 2023
11. “Enabling Extreme Fast Charging with Energy Storage”, Department of Energy, PI: J. Kimball (20), co-PI: J. Park (16), R. Landers (16), R. Bo (16), M. Ferdowsi (16), P. Shamsi (16), \$2,915,376 (\$5,831,082 with match), Nov. 2018 – Oct. 2023
12. “MRI: Acquisition of High-Resolution X-Ray Computed Tomography System for Real-Time, In Situ Studies of Various Effects on Microstructure of Materials”, NSF, J. Park (co-PI, 2%), \$918,397, Oct. 2020 – Sep. 2021
13. “GAANN: Doctoral Research and Training in Advanced Manufacturing”, Department of Education, PI: R.G. Lander (30), co-PI: D. Bristow (14), K. Chandrashekhara (7), L. Chen (7), X. Dong (7), E. Kinzel (7), M. Leu (7), F. Liou (7), H. Pan (7), J. Park (7), \$1,194,000, Oct. 2018 – Sep. 2021
14. “GOALI: Battery Health Dynamics and Its Management”, NSF-CMMI, PI: J. Park (50), co-PI: Robert Landers (50), \$412,559, Sep. 2015 – May. 2021
15. “REU on GOALI: Battery Health Dynamics and Its Management”, NSF-CMMI, PI: J. Park (100), \$16,000, Sep. 2015 – May. 2021

16. “Optimal Energy Scheduling in Microgrids with Photovoltaic (PV) Generation and Energy Storage Systems”, NSF-EPCN, PI: J. Park (50), Co-PI: R. Landers (25), Jonathan Kimball, \$376,649, Jun. 2016 – Aug. 2021
17. “REU on Optimal Energy Scheduling in Microgrids with Photovoltaic (PV) Generation and Energy Storage Systems”, NSF-EPCN, PI: J. Park (50), Co-PI: R. Landers (25), Jonathan Kimball (25), \$8,000, Jun. 2016 – Aug. 2021
18. “GOALI: Mechanically Strong and Electrochemically Robust Porous Electrodes for Batteries Using Nano-/Micro-Additive Manufacturing”, NSF-CMMI, PI: J. Park (100), \$150,000, May. 2016 – Dec. 2020
19. REU on GOALI: Mechanically Strong and Electrochemically Robust Porous Electrodes for Batteries Using Nano-/Micro-Additive Manufacturing”, NSF-CMMI, PI: J. Park (100), \$16,000, May. 2016 – Dec. 2020
20. “Evaluate the cell performance made of the anode material”, Hexalayer, PI: J. Park (100), \$6,000, Dec. 2019 – Mar. 2020
21. “MIC: Novel Battery Materials for Efficient Charge Profile and Energy Storage Management in Microgrids”, Microgrid Industrial Consortium, PI: F. Dogan (34), co-PI: J. Park (33), M. Ferdowsi (33), \$180,000, Jun. 2016 – Aug. 2020
22. “Development of Nanofiber-Based Flexible Solid-State Lithium-Ion”, NASA EPSCoR Missouri Research Infrastructure Development, PI: J. Park (100), \$ 23,500, Oct. 2017 – May. 2019
23. “Mechanical/Chemical Failure of Solid Electrolyte Interphase in Lithium-ion Batteries: Understanding Its Mechanisms and Suppressing Its Onset”, NSF-CBET, PI: J. Park (50), co-PI: X. Liang (50), \$300,000, Sep. 2015 – Aug. 2019
24. “Additive manufacturing of Batteries”, Honeywell Federal Manufacturing & Technologies, PI: H. Pan (75), Co-PI: J. Park (25), \$188,000, Feb. 2017 – Aug. 2018
25. “Parts Inventory Replacement with Additive Manufacturing”, Ameren, PI: R. Landers (50), Co-PI: J. Park (50), \$30,000, May. 2017 – Apr. 2018
26. Microstructure-Controlled 3D Electrodes for Lithium-Ion Batteries”, Ozark Biomedical Inst, \$12,500, PI: J. Park (100), Apr. 2018 – Mar. 2019
27. “REU Site: Additive Manufacturing”, NSF, PI: R.G. Landers (35), co-PI: D.A. Bristow (5), L. Chen (10), G.E. Hilmas (5), E. Kinzel (10), M.C. Leu (5), F.W. Liou (5), J. Newkirk (5), H. Pan (10), J. Park (10), \$415,000, Apr. 2015 – Mar. 2018
28. “GAANN: Doctoral Research and Training in Mechatronics”, Department of Education, PI: Douglas Bristow (20), co-PI: K. DeMars (7), E. Kinzel (7), R.G. Landers (15), M. Leu (7), H. Pan (7), J. Park (7), H. Pernicka (7), J. Rovey (16), \$295,278, Sep. 2015 – Aug. 2018
29. “REU on Optimal Energy Scheduling in Microgrids with Photovoltaic (PV) Generation and Energy Storage Systems”, NSF-EPCN, PI: J. Park (50), co-PI: R. Landers (25), J. Kimball (25), \$8,000, Jun. 2016 – May. 2018
30. “Additive manufacturing of Batteries”, Honeywell Federal Manufacturing & Technologies PI: H. Pan (70), co-PI: J. Park (30), \$187,174, Oct. 2016 – Sep. 2017

### **Internal Funding**

31. “Highly spherical controllable gold nanoparticles for drug delivery via femtosecond laser ablation and plasma environment”, Center for Biomedical Research, PI: J. Park (100), \$10,000, Jul. 2022 – Jun. 2023
32. “Personalized three-dimensional wound dressings with oxygen monitoring system”, Center for Biomedical Research, PI: J. Park (100), \$15,000, Jul. 2021 – Jun. 2022
33. “Tailoring low-temperature performance of lithium-ion batteries”, NASA-Missouri Space Grant Consortium, PI: J. Park (100), \$13,514, Sep. 2021 – Aug. 2022
34. “Additive manufacturing for batteries”, ISC Collaborative Research, PI: J. Park (100), 2021 Fall – 2022 Spring, 25% FTE support

35. “Enabling a novel in-situ alloying method via laser powder bed fusion (LPBF) additive manufacturing Technique”, PI: J. Park (50), Co-PI: M. Leu (50), \$20,000, Aug. 2020-Jul. 2021, 25% FTE support
36. “Advanced modeling for defects and microstructure prediction during selective laser melting process”, ISC Collaborative Research, 25% FTE support”, PI: J. Park (50), Co-PI: M. Leu (50), 2019 Fall – 2020 Spring
37. “Enhanced post-surgical healing and prevention of tissue adhesion via multidrug delivery enabled by electrospun core-shell structured nanofibers”, Center for Biomedical Research, PI: J. Park (100), \$16,000, Jan. 2019 – Dec. 2019
38. “Modeling of Grain Structures of Parts from Selective Laser Melting”, ISC Collaborative Research, 25% FTE support”, PI: J. Park (50), Co-PI: M. Leu (50), 2018 Fall – 2019 Spring
39. “Thermal energy harvesting by shape memory core-shell nanofibers based on ferroelectric and shape memory polymers”, ISC Collaborative Research, PI: J. Park (50), Co-PI: S. Wojnar (50), 25% FTE, Aug. 2017 – May. 2018
40. “A new battery fabrication process via a coupled electric field and local heating process”, Center for Research in Energy and Environment, PI: J. Park (100), 25% FTE support, 2018 Fall – 2019 Spring
41. “Novel 3D structured biodegradable primary batteries”, Center for Biomedical Research, PI: J. Park (100), \$13,000, Jan. 2018 – Dec. 2018
42. “Biodegradable optical devices for photodynamic therapy”, Center for Biomedical Science and Engineering, PI: C.S. Kim (50), co-PI (50): J. Park, Chris Spencer, \$15,000, Jan. 2017 – Dec. 2017
43. “Direction-Modulated Immobilized Biodegradable Brachytherapy”, Ozark Biomedical Initiative for Medical Innovation, PI: J. Park (50), co-PI: C.S. Kim (50), C. Spencer, \$12,500, Feb. 2017 – Dec. 2017
44. “Engineering DNA Nanostructure as a Smart Drug Delivery Carrier for Cancer Therapy”, Center for Biomedical Science and Engineering, PI: R. Wang (66), co-PI: J. Park (34), \$15,910, Jan. 2016 – Dec. 2016
45. “Failure Mechanisms of Germanium Based Li-ion Batteries”, University of Missouri Research Board, PI: J. Park (100), \$44,793, Jul. 2015 – Jun. 2016
46. “Characterization of Degradation Mechanisms in a Ge/Li<sub>2</sub>S Battery System”, MRC, PI: J. Park (100) \$12,000, Oct. 2014 – Jun. 2015

### **SUMMARY OF TEACHING AND ADVISING**

1. Machine Design (ME3708) – undergraduate course (2014~2020)
2. Modeling of Energy Materials (ME5001) – newly developed graduate course (2017~2019)
3. Modeling Across Scales in Computational Mechanics (ME/AE 5539) – newly developed graduate course (Spring 2020)
4. Advanced Thermodynamics (ME/AE 5519) (Spring 2022)
5. Laser Aided Manufacturing and Materials Processing (ME 6657) (Spring 2023)

### **Advising:**

#### **1. Post-doctoral advising (2):**

- Dr. Jie Li (08/2018–12/2018)
- Dr. Wedam Nyaaba (12/2017 – 05/2018)

#### **2. Graduated students (total 7, 5 PhD & 2 MS):**

- Mohammed Al-Yasiri, PhD, May 2017 (Wait University in Iraq)
- Jie Li, PhD, Dec. 2018 (Rivian)
- Yufang He, PhD, Aug. 2019 (Tsinghua University)
- Susmita Sarkar, MS, May 2018 (PhD at Purdue)
- Sindhuja Valluri, MS, May 2018 (Business)
- Yaqi Zhu, PhD, May 2021 (Apple)

- Damola Ajiboye, PhD, May 2021 (Apple)
3. **Currently advising graduate students (7 PhD, 2 MS):**
    - Kaz Adewuyi, PhD expected December 2020
    - Hiep Pham, PhD expected May 2022
    - Tazdik Plateau, PhD expected August 2022
    - Emanuel Olugbade, PhD, expected August 2025
    - Jake Sutton, PhD expected August 2025
    - Kiernan O'Boyle, PhD expected August 2025
    - Gracie Boyer, PhD expected August 2027
    - Caleb Fink, MS, expected August 2024
    - Jacob King, MS, expected August 2025
  4. **Currently advising undergraduate students (paid) (total 4):**
    - Aaron Reed (May 2020 – present)
    - Logan Hendrix (Sep. 2022 – present)
    - Tucker Cudmore (Sep. 2022 – present)
    - Matthew Shannahan (Jan. 2023 – present)
  5. **Past Undergraduate students (total 30):** Derrick Barger (May 2020 – present), James Michels (April 2019 – present), Gracie Boyer (Jan 2020 – present), Kiernan O'Boyle (May 2021 – present), Jacob King (Sep. 2021 – present), Dan Nisbet (Sep. 2021 – present), Simon Zuluaga (Soybean graphene, May 2022-Aug. 2022), Ferando Sepulveda (LFP printing, May 2022-Aug. 2022), Ian Wolf (Flow Batteries, April 2019 - present), Jessica Mast (Electromagnetic, April 2019 – present), Jacob Bandy (May 2020 – present), Katie Fuller (Sep 2020 – present), Jacob Anderson (Sep 2020 – present), Josh Zembas (Sep 2020 – present), Elissa Gafford (Sep 2020 – present), Stephanie Guzman (Sep 2020 – present), Nandini Kumar (Drug delivery, Jan. 2019 – May 2020), Bradley Grothaus (Battery manufacturing, August 2019 – May 2020), Matthew Hoepfner (Battery model, August 2018 – May 2020), Jeffrey Smith (Ethanol-based fuel cells, August 2018 – May 2020), Jackson Pence (SLM model, August 2018 – August 2019), Jessica Mast (Battery manufacturing, May 2019 – August 2019, summer fellowship), William Ziehm (Machine Learning, May 2019 – August 2019, summer fellowship), Mark Wiese (XFC battery, May 2019 – August 2019, summer fellowship), Mikaela Mockenhaupt (Battery module, August 2018 – May 2019), Chris Buford (NSF REU, Additive manufacturing, 2018 Summer), Daniel Yoon (OURE, 2017-2018), Brody Riemann (Battery Impedance analysis, 2017~2018), Garrett Finley (OURE, 2016-2017), John Hoffmann (OURE, 2015-2016), Alex Leong (NSF REU, 2016 summer), Edward Landreth (OURE, 2016), Andrew Fino (OURE, 2016)
  6. **Past high school students (total 3):** Jugal Patel (High school student, Summer Research Academy program, 2017), Jessica Slavic (High school student, Summer Research Academy program, 2016), Daniel Yoon (High school student, Summer Research Academy program, 2016)

## SERVICES

### **Service to Students/Department/University**

1. I serve on the director of undergraduate research program (since 2021)
2. I serve on the chair of design and manufacturing technical committee in the department (Since 2020)
3. I serve on the CEC advisory committee (since 2020)
4. I am an Ex-Officio Director of the Missouri Center for Advance Power System (MOCAP), a cooperative industry-academic venture between the University of Missouri, Missouri S&T, Missouri State University, Missouri Southern State University, and EaglePicher (since 2019)
5. I served on the MAE strategic planning committee (2020)
6. I served on the ME/AE department chair search committee (2020)
7. I served on the ME faculty search committee (2022, 2020)
8. I served on the panel for info seminar for MAE undergraduate research (2019)
9. I served on the committee for faculty hiring plan in energy area (2017)

10. I served on the judging member for Missouri Junior Academy of Science, MJAS (2018)
11. I served on the committee for the department ranking investigation and improvement (2017)

### **Editor and Editorial Board**

1. Associate Editor, Frontiers in Physics, Interdisciplinary Physics (2018-2019)
2. Associate Editor, Frontiers in Energy Research, Electrochemical Energy Conversion and Storage (Since 2020)
3. Academic Editor, PLOS ONE (Since 2019)
4. Editorial board, International Journal of Precision Engineering and Manufacturing (IJPEM) (Since 2023)

### **Professional Service**

- Energy Conversion and Storage Committee, TMS, since 2023
- Symposium Co-organizer: 19th U.S. National Congress on Theoretical and Applied Mechanics - Modeling and Design for Energy Devices, UT Austin TX, June 19-24, 2022
- DOE proposal review panel, 2023, 2022, 2020
- Session chair of ECS 235th ECS Meeting, Dallas, TX, May 26-30, 2019
- Session chair of ECS meeting, 231st ECS Meeting, New Orleans, LA, May 28 - June 2, 2017
- NSF panelist (2015, 2016, 2017)
- Session chair of Collaborative Conference on Materials Research (CCMR) 2017, Jeju island, South Korea, June 26-30, 2017
- Session chair of Sustainable Industrial Processing Summit & Exhibition, Cancun, Mexico, 10/26, 2017
- Chair of Symposium, Mechanics of Materials in Energy Technologies, ASME 2015 Applied Mechanics and Materials Conference, McMAT, Seattle, WA, June 25 – July 1, 2015
- Co-chair, 2015 IMECE ASME, November 13-19, 2015, Houston, Texas, USA
- Annual Merit Review and Peer Evaluation Meeting DOE, 2015
- Journal reviewer: ACS Applied Materials & Interface; ACS Central Science; ACS Energy Letters; Advanced Engineering Materials; Applied Surface Science; Energies; ASME Proceeding Paper; ASME Journal; American Control Conference; Batteries; Challenges; Diamond; Electrochimica Acta; Electrochemistry Communications; Energy Technology; IEEE; IEEE Conference on Control Technology; International Journal of Hydrogen; International Journal of Nanoparticles and Nanotechnology; International Journal of Electrical Power and Energy Systems; International Journal of Engineering Materials; International ASME IMEC; Journal of Applied Electrochemistry; Journal of Electrochemical Society; Journal of Energy Storage; Journal of Naval Architecture and Ocean Engineering; Journal of Physics and Chemistry; Journal of Power Sources; Langmuir; Mathematical Problems in Engineering; Materials and Design; Materials Chemistry; Materials Physics and Chemistry; Micromachines; Nanomaterials; Nature Communication; Process; Mathematical Problems in Engineering; Nanoenergy; Physical Chemistry Chemical Physics; Proceedings of the ASME Dynamic Systems and Control Conference; RSC Advances; and Technologies
- Lead Guest Editor – Journal of chemistry
- Review for University of Wisconsin-Milwaukee research foundation catalyst grant program
- Review for Singapore's AME IRG & YIRG Calls

### **Society Memberships**

The American Society of Mechanical engineers (ASME)  
The Electrochemical Society (ECS)  
Materials Research Society (MRS)  
The Minerals, Metals & Materials Society (TMS)