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Zable Endowed Chair in Energy Technologies
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Founding Director of
Sustainable Power and Energy Center (SPEC)
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Institute for Materials Discovery & Design
Affiliated Faculty with
Center for Memory & Recording Research
Materials Science & Eng. Program

a. Education and Training

Massachusetts Institute of Technology	Postdoc	2005 – 2007
Singapore-MIT Alliance, National University of Singapore	Ph.D	2000 – 2005
Nanyang Technological University, Singapore	B.A.Sc (Matl. Eng.) First class honor	1996 – 2000

b. Research and Professional Experience

2019 – Now Inaugural Director, Institute for Materials Discovery and Design (IMDD)
2017 – Now Professor, NanoEngineering, University of California, San Diego
2015 – 2020 Found Director, Sustainable Power & Energy Center (SPEC)
2013 – 2017 Associate Professor, NanoEngineering, University of California, San Diego
2009 – 2013 Assistant Professor, NanoEngineering, University of California, San Diego
2009 – 2013 Adjunct Professor, Materials Science and Engineering, University of Florida
2008 – 2009 Assistant Professor, Materials Science and Engineering, University of Florida
2007 – 2008 Research Scientist, Materials Sci & Eng, Massachusetts Institute of Technology

Meng's research group (**LESC: Laboratory for Energy Storage & Conversion**) focuses on the field of energy storage and conversion materials: novel electrodes and novel electrolytes for advanced batteries, solar cells and thermoelectric materials; charge ordering, structure stability, processing – structure – property relation in functional ceramics and combining *ab initio* computation with *advanced characterization* experiments for rational materials design for energy applications.
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c. Awards and Honors

2019, Chancellor's Associates Faculty Research Excellence Award
2019, International Battery Association IBA Research Award
2018, Elected Fellow of Electrochemical Society (FECS)
2018, Blavatnik National Awards Finalist http://blavatnikawards.org/
2018, American Chemical Society ACS Applied Materials & Interfaces Young Investigator Award
2018, International Coalition for Energy Storage and Innovation (ICESI) Inaugural Young Career Award
2017, IUMRS-Singapore Young Scientist Research Award
2016, Clean Energy Education & Empowerment (C3E) Award Finalist (Honorable mention)
2016, Charles W. Tobias Award, Electrochemical Society
2015, Frontier of Innovation Award
2014, Science Award Electrochemistry by BASF and Volkswagen
2013, Chancellor's Interdisciplinary Research Award
2011, National Science Foundation (NSF) CAREER Award
2008, Early Career Faculty Travel Award (The Electrochemical Society)
2003, Graduate Student Award (Materials Research Society)
2002, Systems on Silicon Manufacturing Co. Pte. Ltd (SSMC) Award
2000, Singapore-MIT Alliance SMA Postgraduate Study Scholarship (2000-2005)
1998, Industrial Attachment Book Prize
1996, Singapore Welding Society Book Prize
1995, Ministry of Education Singapore Undergraduate Study Scholarship (1996-2000)
1994, Wong's Fund (USA) Award

d. Peer-Reviewed Journal Publications (Total 193, H-index 67, info from Google Scholar, *corresponding author)

1. D. G. Lee, M. Kim, S. Wang, B. J. Kim, Y. S. Meng and H. S. Jung, "Effect of Metal Electrodes on Aging-Induced Performance Recovery in Perovskite Solar Cells", **ACS Appl. Mater. Interfaces**, ASAP, 2020.
2. J. Holoubek, Y. Yin, M. Li, M. Yu, Y. S. Meng, P. Liu and Z. Chen, "Exploiting Mechanistic Solvation Kinetics for Dual-Graphite Batteries with High Power Output at Extremely Low Temperature", **Angew. Chem**. ASAP, 2020.
3. J. Doux, H. Nguyen, D. H. S. Tan, A. Banerjee, X. Wang, E. A. Wu, C. Jo, H. Yang and Y. S. Meng, "Stack Pressure Considerations for Room-Temperature All-Solid-State Lithium Metal Batteries", **Adv. Energy Mater**. 1903253, 2019.
4. D. H. S. Tan, E. A Wu, H. Nguyen, Z. Chen, M. A. T. Marple, J. Doux, X. Wang, H. Yang, A. Banerjee and Y. S. Meng, "Elucidating Reversible Electrochemical Redox of Li6PS5Cl Solid Electrolyte", **ACS Energy Lett.**, 4, 2418−2427, 2019.
5. D. H. S. Tan, A. Banerjee, Z. Deng, E. A. Wu, H. Nguyen, J. Doux, X. Wang, J. Cheng, S. P. Ong, Y. S. Meng and Z. Chen, "Enabling Thin and Flexible Solid-State Composite Electrolytes by the Scalable Solution Process", **ACS Appl. Energy Mater.,** 2, 9, 6542-6550, 2019.
6. A. Banerjee, H. Tang, X. Wang, J. Cheng, H. Nguyen, M. Zhang, D. Tan, T. Wynn, E. Wu, J.M. Doux, T. Wu, L. Ma, G. E. Sterbinsky, M. Dsouza, S. P. Ong, and Y. S. Meng, "Revealing Nanoscale Solid-Solid Interfacial Phenomena for Long-Life and High-Energy All-Solid-State Batteries**", ACS Appl. Mater. Interfaces**, 11, 46, 43138-43145, 2019.
7. Chengcheng Fang, Jinxing Li, Minghao Zhang, Yihui Zhang, Fan Yang, Jungwoo Z. Lee, Min-Han Lee, Judith Alvarado, Marshall A. Schroeder, Yangyuchen Yang, Bingyu Lu, Nicholas Williams, Miguel Ceja, Li Yang, Mei Cai, Jing Gu, Kang Xu, Xuefeng Wang and Ying Shirley Meng*, "Quantifying inactive lithium in lithium metal batteries", **Nature**, 573, 511, 2019.
8. J. Shin, J. K. Seo, R. Yaylian, A. Huang and Y. S. Meng, "A review on mechanistic understanding of MnO2 in aqueous electrolyte for electrical energy storage systems", **International Materials Review**, 8, 2019
9. H. Hirsh, M. Olguin, H. Chung, Y. Li, S. Bai, D. Feng, D.Wang, M. Zhang and Y. S. Meng, "Meso-Structure Controlled Synthesis of Sodium Iron-Manganese Oxides Cathode for Low-Cost Na-Ion Batteries", **Journal of The Electrochemical Society**, 166 (12) A2528, 2019
10. H. Chung, A. Grenier, R. Huang, X Wang, Z. Lebens-Higgins, J. Doux, S. Sallis, C. Song, P. Ercius, K. Chapman, L. J. Piper, H. Cho, M. Zhang and Y. S. Meng, "Comprehensive study of a versatile polyol synthesis approach for cathode materials for Li-ion batteries", **Nano Research**, 12, 9, 2238, 2019.
11. J. Liu, Z. Bao, Y. Cui, E. J. Dufek, J. B. Goodenough, P. Khalifah, Q. Li, B. Y. Liaw, P. Liu, A. Manthiram, Y. S. Meng, V. R. Subramanian, M. F. Toney, V. V. Viswanathan, M. S. Whittingham, J. Xiao, W. Xu, J. Yang, X.-Q. Yang and J.-G. Zhang, "Pathways for practical high-energy long-cycling lithium metal batteries" **Nature Energy**, 4, 180, 2019.
12. Y. Shi, M. Zhang, Y. S. Meng and Z. Chen, *"Ambient-Pressure Relithiation of Degraded* $Li_xNi_{0.5}Co_{0.2}Mn_{0.3}O_2$ *(0 < x < 1) via Eutectic Solutions for Direct Regeneration of Lithium-Ion Battery Cathodes",* **Advanced Energy Materials,** 190045, 2019.
13. H. Zhou, H. Liu, Y. Li, X. Yue, X. Wang, M. Gonzalez, Y. S. Meng and P. Liu, "In-situ formed polymer gel electrolytes for lithium batteries with inherent thermal shutdown safety features", **J. Mater. Chem. A**, 7, 16984, 2019.
14. D. Wang, H. Liu, M. Li, X. Wang, S. Bai, Y. Shi, J. Tian, Z. Shan, Y. S. Meng, P. Liu, Z. Chen, "Nanosheet-assembled hierarchical Li4Ti5O12 microspheres for high-volumetric-density and high-rate Li-ion battery anode", **Energy Storage Materials**, 21, 361–371, 2019.
15. Y. Yang, D. M. Davies, Y. Yin, O. Borodin, J. Z. Lee, C. Fang, M. Olguin, Y. Zhang, E. S. Sablina, X. Wang, C. S. Rustomji* and Y. S. Meng*, "High-Efficiency Lithium-Metal Anode Enabled by Liquefied Gas Electrolytes", **Joule** , 3, 1–15, 2019.
16. S. Hong, Y. Gu, J. K. Seo, J. Wang, P. Liu, Y. S. Meng, S. Xu, R. Chen, "Wearable thermoelectrics for personalized thermoregulation", **Science Advances**, 5, 0536, 2019.

17. C. Fang, X. Wang, and Y. S. Meng, "Key Issues Hindering a Practical Lithium-Metal Anode" **Trends in Chemistry**, 1, 152, 2019
18. H. Nguyen, A. Banerjee, X. Wang, D. Tan, E. A. Wu, J. Doux, R. Stephens, G. Verbist, Y. S. Meng*, "Single-step synthesis of highly conductive Na3PS4 solid electrolyte for sodium all solid-state batteries", **Journal of Power Sources**, 435, 126623, 2019.
19. J. Alvarado, M. A Schroeder, T. P Pollard, X. Wang, J. Z Lee, M. Zhang, T. Wynn, M. Ding, O. A Borodin, Y. S. Meng* and K. Xu*, "*Bisalt Ether Electrolytes_ A Pathway Towards Lithium Metal Batteries with Ni-rich Cathodes*", **Energy Environ. Sci.**, 12, 780, 2019.
20. J.-P. Correa-Baena, Y. Luo, T. M. Brenner, … S. Wang, Y. S. Meng, T. Buonassisi and D. P. Fenning, *"Homogenized Halides and Alkali Cation Segregation in Alloyed Organic-Inorganic Perovskites"*, **Science**, 363(6427), 727, 2019.
21. J. Z. Lee, T. A. Wynn, M. A. Schroeder, J. Alvarado, X. Wang, K. Xu, and Y. S. Meng*, *"Cryogenic Focused Ion Beam Characterization of Lithium Metal Anodes"*, **ACS Energy Letters**, 4, 489, 2019.
22. C. Wang, Y. S. Meng, and Kang Xu, *"Fluorinating Interphases"*, **Journal of The Electrochemical Society**, 166 (3), A5184, 2019.
23. D.M. Davies, M.G. Verde, O. Mnyshenko, Y.R. Chen, R. Rajeev, Y.S. Meng* and G. Elliott*, *"Combined Economic and Experimental Evaluation of Energy Storage for Grid Applications"*, **Nature Energy**, 4, 42, 2019.
24. T. A. Wynn, C. Fang, M. Zhang, H. Liu, D. M Davies, X. Wang, D. Lau, J. Z Lee, B.-Y. Huang, K. Z. Fung, C.-T. Ni and Y. S. Meng*, *"Mitigating Oxygen Release in Anionic-Redox-Active Cathode Materials by Cationic Substitution through Rational Design"*, **Journal of Materials Chemistry A,** 6, 24651, 2018.
25. S. Wang, Z. Huang, X. Wang, Y. Li, M. Günther, S. Valenzuela, P. Parikh, A. Cabreros, W. Xiong, and Y. S. Meng*, *"Unveiling the Role of tBP–LiTFSI Complexes in Perovskite Solar Cells"* **J. Am. Chem. Soc**., 140 (48), 16720, 2018.
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27. T.A. Wynn, J.Z. Lee , A. Banerjee and Y.S. Meng* *"In situ and operando probing of solid– solid interfaces in electrochemical devices"* **MRS Bulletin**, 43 (10), 768, 2018.
28. L. Yin, G. S. Mattei, Z. Li, J. Zheng, W. Zhao, F. Omenya, C. Fang, W. Li, J. Li, Q. Xie, J.-G. Zhang, M. S. Whittingham, Y. S. Meng, A. Manthiram, and P. G. Khalifah *"Extending the limits of powder diffraction analysis_ Diffraction parameter space, occupancy defects, and atomic form factors"* **Review of Scientific Instruments,** 89, 093002, 2018
29. Y. Fang, S. Ran, W. Xie, S. Wang, Y. S. Meng, and M. B. Maple,*"Evidence for a conducting surface ground state in high-quality single crystalline FeSi"*, **Proceedings of National Academy of Sciences (PNAS)**, 115 (34) 8558, 2018
30. X. Wang, Y. Li, X. Bi, L. Ma, T. Wu, M. Sina, S. Wang, M. Zhang, J. Alvarado, B. Lu, A. Banerjee, K. Amine, J. Lu, and Y. S. Meng* *"Hybrid Li-Ion and Li-O2 Battery Enabled by Oxyhalogen-Sulfur Electrochemistry"*, **Joule**, 2 (11), 2381, 2018,
31. S. M. Wood, C. Fang, E. J. Dufek, S. C. Nagpure, S. V. Sazhin, B. Liaw, and Y. S. Meng*, *"Predicting Calendar Aging in Lithium Metal Secondary Batteries_ The Impacts of Solid Electrolyte Interphase Composition and Stability"*, **Adv. Energy Mater.** 8(26), 1801427, 2018
32. M. Zhang, H.D. Liu, Z. Liu, C. Fang, and Y. S. Meng*, *"Modified Coprecipitation Synthesis of Mesostructure-Controlled Li-Rich Layered Oxides for Minimizing Voltage Degradation"*, **ACS Appl. Energy Mater.**, 1(7), 3369, 2018.
33. X. Ren, S. Chen, H. Lee, D. Mei, M. H. Engelhard, S. D. Burton, W. Zhao, J. Zheng, Q. Li, M. S. Ding, M. Schroeder, J. Alvarado, K. Xu, Y. S. Meng, J. Liu, J-G. Zhang, W. Xu, *" Localized High-Concentration Sulfone Electrolytes for High-Efficiency Lithium-Metal Batteries"*, **Chem.**, 4, 1, 2018.
34. Y. Shi, M. Zhang, C. Fang, and Y. S. Meng*, *"Urea-based hydrothermal synthesis of $LiNi_{0.5}Co_{0.2}Mn_{0.3}O_2$ cathode material for Li-ion battery"*, **Journal of Power Sources**, 394, 114, 2018
35. H.D. Liu, X. Wang, H. Zhou, H.-D. Lim, X. Xing, Q. Yan, Y. S. Meng, and P. Liu, *"Structure and Solution Dynamics of Lithium Methyl Carbonate as a Protective Layer For Lithium Metal"*, **ACS Appl. Energy Mater.**, 1(5),1864, 2018.

36. J. K. Seo, J.W. Shin, H. Chung, P. Y. Meng, X. Wang, and Y. S. Meng*, *"Intercalation and Conversion Reactions of Nanosized β-MnO2 Cathode in the Secondary Zn_MnO_2 Alkaline Battery"*, **J. Phys. Chem. C**, 122 (21), 11177, 2018.
37. A. Singer, M. Zhang, S. Hy, D. Cela, C. Fang, T. A. Wynn, B. Qiu, Y. Xia, Z. Liu, A. Ulvestad, N. Hua, J. Wingert, H. Liu, M. Sprung, A. V. Zozulya, E. Maxey, R. Harder, Y. S. Meng* and O. G. Shpyrko*, *"Nucleation of dislocations and their dynamics in layered oxide cathode materials during battery charging*", **Nature Energy**, 3, 64, 2018 Chosen as the Cover
38. D. J. Alvarado, M. A. Schroeder, M. Zhang, O. Borodin, E. Gobrogge, M. Olguin, M. S. Ding, M. Gobet, S. Greenbaum, Y. S. Meng*, Kang Xu*, *"A carbonate-free, sulfone-based electrolyte for high-voltage Li-ion batteries"*, **Materials Today,** 21 (4), 341, 2018. Editor's choice
39. H. Li, H. Tang, C. Ma, Y. Bai, J. Alvarado, B. Radhakrishnan, S. P. Ong, F. Wu, Y. S. Meng*, and C. Wu*, *"Understanding the Electrochemical Mechanisms Induced by Gradient Mg^{2+} Distribution of Na-Rich $Na_{3+x}V_{2-x}Mg_x(PO_4)_{3\_C}$ for Sodium Ion Batteries"* **Chem. Mater.,** 30 (8), 2498, 2018.
40. E. A. Wu, C. S. Kompella, Z. Zhu, J. Z. Lee, S. C. Lee, I.-H. Chu, H. Nguyen, S. P. Ong, A. Banerjee, and Y. S. Meng*, *"New Insights into the Interphase between the Na Metal Anode and Sulfide Solid-State Electrolytes_ A Joint Experimental and Computational Study"* **ACS Appl. Mater. Interfaces**, 10 (12), 10076, 2018.
41. J. Z. Lee, T. A. Wynn, Y. S. Meng*, D. Santhanagopalan*, *"Focused Ion Beam Fabrication of LiPON-based Solid-state Lithium-ion Nanobatteries for In Situ Testing"* **Journal of Visualized Experiments**, e56259, 2018.
42. H.D. Liu, H. Liu, I. D. Seymour, N. Chernova, K. M. Wiaderek, N. M. Trease, S. Hy, Y. Chen, K. An, M. Zhang, O. J. Borkiewicz, S. H. Lapidus, B. Qiu, Y. Xia, Z. Liu, P. Chupas, K. Chapman, M. S. Whittingham, C. P. Grey and Y. S. Meng*, *"Identifying the chemical and structural irreversibility in $LiNi_{0.8}Co_{0.15}Al_{0.05}O2$ – A model compound for classical layered intercalation"* **J. Mater. Chem. A**, 6, 4189, 2018.
43. S. E. Root, C. W. Carpenter, L. V. Kayser, D. Rodriquez, D. M. Davies, S. Wang, S. T. M. Tan, Y. S. Meng , and D. J. Lipomi, *"Ionotactile Stimulation_ Nonvolatile Ionic Gels for Human–Machine Interfaces"* **ACS Omega**, 3 (1), 662, 2018.
44. J. Huang, H.D. Liu, T. Hu, Y. S. Meng, and J. Luo, *"Enhancing the electrochemical performance of Li-rich layered oxide Li1.13Ni0.3Mn0.57O2 via WO3 doping and accompanying spontaneous surface phase formation"*, **Journal of Power Sources**, 375, 21, 2018.
45. X. Wang, M. Zhang, J. Alvarado, S. Wang, M. Sina, B. Lu, J. Bouwer, W. Xu, J. Xiao, J.-G. Zhang, J. Liu, and Y. S. Meng*, *"New Insights on the Structure of Electrochemically Deposited Lithium Metal and Its Solid Electrolyte Interphases via Cryogenic TEM"*, **Nano Letters**, 17 (12), 7606, 2017.
46. M. D. Radin, J. Alvarado, Y. S. Meng, and A. V. der Ven*, *"Role of Crystal Symmetry in the Reversibility of Stacking-Sequence Changes in Layered Intercalation Electrodes"*, **Nano Letters**, 17 (12), 7789, 2017.
47. T. Yu, Q. Li, X. Zhao*, H. Xia, L. Ma, J. Wang, Y. S. Meng*, and X. Shen, *"Nanoconfined Iron Oxychloride Material as a High-Performance Cathode for Rechargeable Chloride Ion Batteries"*, **ACS Energy Lett.**, 2, 2341, 2017.
48. F. Lin, Y. Liu, X. Yu, L. Cheng, A. Singer, O. G. Shpyrko, H. L. Xin, N. Tamura, C. Tian, T-C Weng, X-Q Yang, Y. S. Meng, D. Nordlund, W. Yang, and M. M. Doeff, *"Synchrotron X-ray Analytical Techniques for Studying Materials Electrochemistry in Rechargeable Batteries"* **Chem. Rev.**, 117 (21), 13123, 2017.
49. J. Huang, H. D. Liu, N. Zhou, K. An, Y. S. Meng and J. Luo, *"Enhancing the Ion Transport in LiMn1.5Ni0.5O4 by Altering the Particle Wulff Shape via Anisotropic Surface Segregation"*, **ACS Appl. Mater. Interfaces**, 9(42), 36745, 2017.
50. P. Parikh, C. Senowitz, D. Lyons, I. Martin, T. J. Prosa, M. DiBattista, A. Devaraj, and Y. S. Meng*, *"Three-Dimensional Nanoscale Mapping of State-of-the-Art Field-Effect Transistors (FinFETs)"*, **Microscopy and Microanalysis**, 23(5), 916, 2017.
51. M. Wang, Y. Shi, D. J. Noelle, A. V. Le, H. Yoon, H. Chung, M. Zhang, Y. S. Meng and Y. Qiao *"Internal short circuit mitigation of high-voltage lithium-ion batteries with functional current collectors"* **RSC Advances**, 7, 45662, 2017.
52. M. Zhang, K. Yin, Z. D. Hood, Z. Bi, C. A. Bridges, S. Dai, Y. S. Meng, M. P. Paranthaman and M.

Chi, *"In situ TEM observation of the electrochemical lithiation of N-doped anatase TiO2 nanotubes as anodes for lithium-ion batteries"*, **J. of Materials Chemistry A.**, 38, 20651, 2017.

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54. R. Kumar, J. Wang, and Y. S. Meng*, *"Conformal, Wearable Batteries: Powering Warfighter Equipment"*, **Homeland Defense and Security Information Analysis Center (HDIAC) Newsletter**, 4(3), 4, 2017.
55. S. Kim, J. K. Seo, J. H. Park, Y. Song, Y. S. Meng, M. J. Heller, *"White-light emission of blue-luminescent graphene quantum dots by europium (III) complex incorporation"* **Carbon**, 2017, 124, 479
56. J. Alvarado, C. Ma, S. Wang, K. Nguyen, M. Kodur, and Y. S. Meng*, *"Improvement of the Cathode Electrolyte Interphase on P2-$Na_{2/3}Ni_{1/3}Mn_{2/3}O_2$ by Atomic Layer Deposition"*, **ACS Appl. Mater. Interfaces**, 9(31), 26518, 2017.
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60. H. Shobukawa, J. Alvarado, Y. Yang, Y. S. Meng*, *"Electrochemical performance and interfacial investigation on Si composite anode for lithium ion batteries in full cell"*, **Journal of Power Sources**, 359, 173, 2017.
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62. C. Zhu, L. Yang, J. K. Seo, X. Zhang, S. Wang, J.W. Shin, D. Chao, H. Zhang, Y. S. Meng* and H. J. Fan*, *"Self-branched a-MnO2_d-MnO2 heterojunction nanowires with enhanced pseudocapacitance"*, **Materials Horizons**, 4, 415, 2017.
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64. C. Ma, J. Alvarado, J. Xu, R. J. Clément, M. Kodur, W. Tong, C. P. Grey* and Y. S. Meng*, *"Exploring Oxygen Activity in the High Energy P2-Type Na0.78Ni0.23Mn0.69O2 Cathode Material for Na-ion Batteries"*, **J. Am. Chem. Soc.,** 139(13), 4835, 2017.
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191. Y.S. Meng, G. Ceder, C.P. Grey, W.-S. Yoon, M. Jiang, J. Greger and Y. Shao-Horn, *"Cation ordering in layered O3 $Li[Ni_xLi_{1/3-2x/3}Mn_{2/3-x/3}]O_2$ ($0 \le x \le 1/2$) compounds"*, **Chemistry of Materials**, 17 (9), 2386-2394, 2005.
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e. Patents and Book Chapter

1. Y. S. Meng, F. So, J. Xue, J. Reynolds, K. R. Zawoy, "Integrated PV/Battery/OLED Lighting Module (SoLiOled)," US/183359, 2012.
2. Y. S. Meng, "High Energy Density Cathode Materials for Lithium Ion Batteries," US 12/143606, 2012.
3. Y.S. Meng and H. Liu, "Lithium and Sodium Contacting Layered Oxide Material, Cathodes and Sodium Ion Electrochemical Cells", US/14/917, 340, 2016
4. J. Wang, R. Kumar, Y.S. Meng, J.W. Shin and L. Yin, "Hyper-elastic Binder for Printed, Stretchable Electronics", US/15/820, 284 and PCT/US62860, 2017
5. Y.S. Meng, M. Zhang, H. Liu, D. Qian and C. Fang, "Lithium-Excess Cathode Material and Co-precipitation Formation Method", US/15/774,876
6. C. Rustomji, Y.S. Meng and Y. Yang, "Electrochemical Energy Storage Device", PCT/US29821, 2017
7. Z. Zhu, L.H. Chu, S.P. Ong, E. Wu, H. Nguyen and Y.S. Meng," Lithium and Sodium Superionic Conductors", US/059340, 2017
8. D. Steingart, B. Hertzberg, M. Chamoun, G. Davies and Y.S. Meng," Alkaline Electrolyte Useful for a Rechargeable Alkaline Electrochemical Cell", PCT/US/25989, 2018
9. D. Tan, A. Banerjee, "Electrolyte composite for batteries", US Patent App. 16/409,275, 2019
10. "Chemical formulations for electrochemical device" International App. PCT/US19/32414 (2019-023†§) May 2019

11. A chapter in **Handbook of Solid State Batteries** 2nd Edition, Edited by: Nancy J Dudney, William C West and Jagjit Nanda (World Scientific Publishing)
12. A chapter in **Handbook of Materials Modeling-Battery Electrodes, Electrolytes, and Their Interfaces**, Edited by: Wanda Andreoni and Sidney Yip (Springer)

f. Selected Keynote and Invited Talks

1. Keynote Talk, Materials Research Meeing (MRM), Yokohama, Japan, December 11th, 2019
2. Invited Talk, Symposium EN02, MRS Fall, Boston, MA, December 2nd, 2019.
3. Seminar Talk, College de France, Paris, France, October 18th, 2019
4. Plenary Talk, Li Battery Discussions (LiBD), Bordeaux, France, September 16th, 2019.
5. Invited Talk, Symposium ENFL, ACS Annual Meeting, Sand Diego, August 26th, 2019.
6. Invited Talk, Symposium N, 10th International Conference on. Materials for Advanced Technologies, ICMAT, Singapore, June 26th, 2019
7. Keynote talk, LG Chem Open Innovation Forum 2019, Seoul, South Korea May 9th, 2019

8. Invited talk, Lithium Battery International Summit (LIBS), 2019, Shenzhen, China, May 7th, 2019
9. Seminar Talk, ETH, Zurich, Switzerland, Feb. 19th, 2019.
10. Keynote talk, Center for ElectroChemistry (CEC) 2019 Annual Workshop, Austin, Texas, USA, Feb10th, 2019.
11. Keynote talk, International Coalition for Energy Storage and Innovation (ICESI) and Pacific Power Source Symposium Joint Meeting, Kona Hawaii, USA, January 8th, 2019
12. Invited talk, Materials Research Society MRS Fall 2018, Boston, MA, USA, Nov. 28th, 2018
13. Invited talk, 11th International Conference on Advanced Lithium Batteries for Automobile Applications (ABAA), Huzhou, China, October 13th, 2018
14. Award Talk, ACS, Boston, August 21, 2018
15. Invited talk, Symposium on Advanced Batteries and Supercapacitors for Energy Storage, 12th International Conference on Ceramic Materials, Singapore, July 25th, 2018
16. Keynote talk, International Meeting on Lithium Batteries (IMLB) 2018, Kyoto, Japan, June 18th, 2018
17. Invited talk, Advanced Automotive Battery Conference, San Diego, CA, USA, June 5th, 2018
18. Department Colloquium, Nuclear Engineering and Materials Science and Engineering, MIT, April 27th, 2018.
19. Seminar, School of Engineering and Applied Sciences, Harvard University, April 25th, 2018
20. Invited talk, Symposium on Safe and High Energy Batteries, Materials Research Society MRS, Phoenix, AZ, April 4th, 2018
21. Discussion Leader, Gordon Research Conference (GRC) on Batteries, Ventura, CA, USA, Feb. 27th – March 1st, 2018
22. Keynote talk, International Battery Association (IBA) Meeting, Jeju, South Korea, March 12-15th, 2018.
23. Invited talk, Munich Battery Discussion Meeting, Munich, Germany, February 19-20th, 2018
24. Keynote talk, Nature Conference on Electrochemical Energy Systems, Shenzhen, China, January 13-15th, 2018.
25. Department of Chemical & Biological Engineering Colloquium, Princeton University, November 29, 2017.
26. Invited talk, 10th International Conference on Advanced Lithium Batteries for Automobile Applications (ABAA), Chicago, USA, October 23rd, 2017.
27. Invited talk, Symposium on advanced characterization in honor of Dr. Frank McLarnon, Electrochemical Society Meeting, National Harbor, October 3rd, 2017.
28. Department of Energy & Environmental Materials, School of Materials Science and Engineering, Beijing Institute of Technology, China, September 2nd, 2017.
29. Keynote talk, International Union of Materials Research Society – The 15th International Conference on Advanced Materials (IUMRS-ICAM), Kyoto, Japan, August 31st, 2017
30. Department of Chemistry, Dalhousie University, Halifax, Canada, August 22nd, 2017
31. Materials Science & Engineering Department Seminar, Stanford University, May 5th, 2017
32. US China Electric Vehicle Battery Technology (EVBT), Zhuhai, China, April 17th, 2017
33. 3rd International Forum on Cathode and Anode Materials for Advanced Batteries, Ningbo, China, April 14th, 2017
34. Keynote talk, International Battery Association (IBA), Nara, Japan, March 6th, 2017
35. Chinese University of Hong Kong, Physics Department Colloquium, March 2nd, 2017
36. Hong Kong Polytechnic University Colloquium, February 28th, 2017
37. 9th ABAA International Conference on Advanced Lithium Batteries for Automotive Applications, Huzhou, China, October 18th, 2016.
38. 18th International Meeting of Lithium Batteries, Chicago, IL, June 20th, 2016
39. Department of Materials Science & Engineering seminar, University of California Santa Barbara, May 27th, 2016
40. Sino-American Technology & Engineering Conference, Wuhu, China, May 16th, 2016
41. Department of Physics seminar, University of Houston, Houston, TX, April 25th, 2016
42. Department of Physics and Applied Physics seminar, Nanyang Technological University, Singapore, March 25th, 2016

43. Symposium EE7, Materials Research Society (MRS), Spring Meeting, Phoenix, AZ, March 31st, 2016
44. Munich Battery Discussion Meeting by BMW, Munich, Germany, March 14th, 2016
45. 2016Gordon Research Conference (GRC) on Batteries, Ventura California, February 22nd, 2016
46. 3rd Euro-Mediterranean Conference on Materials and Renewable Energies (EMCMRE-3), Marrakech, Morocco, November 2-6th, 2015
47. International Society of Electrochemistry (ISE), Hong Kong Satellite Meeting and Taipei Annual Meeting, Oct 3-6, 2015.
48. 2nd International Forum on Anode & Cathode Materials for Advanced Batteries, Hangzhou, China, April 22nd, 2015.
49. 10th China-US Battery Workshop, Beijing, China Mar 30th, 2015.
50. Mechanical Engineering Seminar, Princeton University, Dec 5th, 2014
51. Symposium Z, Materials Research Society MRS Fall Meeting, Boston, Dec 3rd, 2014
52. 55th Japan Battery Symposium, Kyoto, Japan, Nov 20th, 2014.
53. 226th Electrochemical Society Meeting (ECS), Cancun, Mexico, Oct 7th, 2014.
54. Frontier of Engineering, National Academia of Engineering, Irvine, CA, Sep. 12th, 2014.
55. XXIII International Materials Research Congress, Cancun, Mexico, August 17th, 2014.
56. Gordon Research Conference on Electrodeposition, New Hampshire, ME, July 30th, 2014.
57. Argonne National Lab Chemical Engineering Division Colloquium Talk, May 6th, 2014.
58. International Battery Association (IBA) Meeting, Melbourne, Australia, March 4th- 7th, 2014.
59. Department of Physics and Atmospheric Science, Dalhousie University, December 9th, 2013.
60. Materials Research Society Meeting, Symposium CC, Boston, December 4th, 2013.
61. Institute for Pure and Applied Mathematics, Materials for a Sustainable Energy Future Program, Los Angeles, September 9th, 2013.
62. 7th International Conference on Materials for Advanced Technologies (ICMAT), July 4th, Singapore 2013.
63. Massive Energy Storage, Engineering Conferences International, Newport Beach, CA, June 24th, 2013.
64. PacRim American Ceramics Society Meeting, Coronado Island, CA, June 5th, 2013.
65. Department of Materials Science and Engineering, UC Riverside, CA, May 29th, 2013.
66. International Battery Association (IBA) meeting, Barcelona, Spain, March 11th, 2013.
67. Funding Program for World-leading Innovative R&D on Science and Technology (FIRST) "Innovative Basic Research Toward Creation of High-performance Battery" Tokyo, Japan, January 17th, 2013.
68. "Big Energy Seminar Series", University of Colorado Boulder, November 8th, 2012.
69. European Microscopy Congress, Manchester, UK, September 19th, 2012.
70. International Conference of Young Researchers on Advanced Materials, ICYRAM, Electrochemical Energy Session, Singapore, July 2nd, 2012.
71. HRL Laboratories Colloquium, Malibu CA, June 21st, 2012.
72. Materials Research Society, Symposium O Invited talk, San Fransisco, CA, April 12th 2012.
73. Center for Computational Sciences, University of Kentucky, March 21st, 2012.
74. Taipei Forum on Large-Format Power Lithium Batteries, Taipei, February 15th, 2012.
75. International Battery Association (IBA) meeting, Kona, Hawaii, January 12th, 2012.
76. Gordon Research Conference (GRC) on Electrochemistry, Ventura, CA, January 11th, 2012.
77. Ningbo-2011 International Symposium on Development and Commercialization of Power Lithium-ion Batteries, China, November 10th, 2011.
78. Department of Materials Science and Engineering, Seoul National University, Korea, August 12th, 2011.
79. Department of Materials Science and Engineering, Northwestern University, May 23rd, 2011.
80. Department of Chemical Engineering and Materials Science, UC Irvine, April 1st, 2011.
81. Department of Materials Science and Engineering, UCLA, October 29th, 2010.
82. Symposium B4 Electrode-Electrolyte Interfaces in Li-ion Batteries, Electrochemical Society Meeting Fall 2010, Las Vegas, October 11-14th, 2010.
83. Gordon Research Conference, Solid State Studies in Ceramics, New Hampshire, August 15-17th, 2010.

84. UCSD Research Expo, April 15, 2010.
85. Materials Science & Technology 2009 Conference, Pittsburgh, Oct. 27, 2009.
86. State Key Lab for Physical Chemistry of Solid Surfaces, Xiamen University, China, June 25, 2009.
87. Department of Physics, Chinese University of Hong Kong, June 22, 2009.
88. Oak Ridge National Laboratory, USA, May 28, 2009.
89. CERMACS Annual Meeting, American Chemical Society, Cleveland, Ohio, May 22, 2009.
90. Florida Institute of Sustainable Energy (FISE) Seminar, March 16, 2009.
91. Department of NanoEngineering, University of California San Diego, December 8, 2008.
92. Materials Science and Technology 2008 Conference, Pittsburg, Pennsylvania, October 6, 2008.
93. Department of Materials Science and Engineering, University of Michigan, September 26, 2008.
94. International Materials Research Congress (IMRC), Annual Conference, Cancun, Mexico, August 18-21, 2008.
95. Korea Electrotechnology Research Institute (KERI), Pusang, Korea, July 7, 2008.
96. National Taiwan University of Science and Technology, Taipei, Taiwan, June 20, 2008.
97. International Meeting for Lithium Batteries (IMLB) 2008, Tianjin, China, June 22-27, 2008.
98. International Materials Research Congress (IMRC), Annual Conference, Cancun, Mexico, October 28-30, 2007.
99. University of Bordeaux, ICMCB, France, September 27, 2007.
100. CSIRO Energy Technology, Commonwealth Scientific and Industrial Research Organization (CSIRO), Melbourne, Australia, July 24-25, 2007.
101. Department of Physics, University of California Davis, April 9 – 10, 2007.
102. Nanoscience and Nanoengineering Institute and Department of Materials Science and Engineering, University of California Berkeley, January 25, 2007.
103. Department of Materials Science and Engineering, University of Florida, January 18, 2007.
104. Department of Physics, Chinese University of Hong Kong, September 1, 2006.
105. State Key Lab for Physical Chemistry of Solid Surfaces, Xiamen University, China, Aug 31, 2006.
106. The 7th China International Battery Fair, Beijing, China June 28-30, 2006.
107. Lawrence Livermore National Laboratory, USA, June 9, 2006.
108. Department of Materials Science and Engineering, Stanford University, Palo Alto, June 5, 2006.
109. Industrial Technology Research Institute ITRI, Taiwan, May 19, 2006.
110. International Battery Association – Hawaii Battery Conference (IBA-HBC), Hawaii, USA, Jan 9-13, 2006.
111. Department of Mechanical Engineering, University of Texas, Austin, May 5, 2005.

g. Synergistic Activities

Inaugural Director of Institute for Materials Discovery and Design (https://imdd.ucsd.edu/) a joint initiative of the Jacobs School of Engineering and Division of Physical Sciences at the University of California San Diego. The Institute's unique approach will be to apply data analytics and machine learning together with rapid materials synthesis and multi-scale characterization in order to accelerate the discovery, design, synthesis and evaluation of novel functional materials.

Founding Director of Sustainable Power and Energy Center (http://spec.ucsd.edu) The SPEC consists more than fifteen faculty members from interdisciplinary fields, who all focus on making breakthroughs in distributed energy generation, storage and the accompanying integration-management systems.

Editor in Chief – MRS Energy & Sustainability 2019

Technical Editor– Journal of Power Sources (IF 6.7) 2015 to 2019

Associate Editor–NPG Asia Materials (IF 9.0) 2012-2015

Editorial Board Member - Ionics (IF 1.7) Sustainable Energy and Fuels (new journal 2016), Advanced Energy Materials (IF 21.8), Chemical Society Reviews (IF 40.18) and Chemical Reviews (IF 47.9)

Guest Editor – First focused issue for ***Journal of the Electrochemical Society (JES)*** on "Intercalation Compounds" (co-editor, Stanley Whittingham)

Guest Editor – Focused issue for MRS Bulletin on "Frontier in In Situ TEM" (co-editors, Haimei Zheng and Yimei Zhu)

Regular reviewer for Journal of American Chemical Society, Chemistry of Materials, Journal of the Electrochemical Society, Electrochemical and Solid-State Letters, Solid State Ionics, Journal of Materials Research, Journal of Physical Chemistry, Advanced Energy Materials, ACS Nano and Energy and Environmental Science, Nature Communications, Nature Energy, Nature Chemistry and Science.
Panel reviewer for National Science Foundation and Department of Energy, USA and various overseas funding agencies including Hong Kong Council of Research, German Research Foundation, Israel Science Foundation and Canada Foundation for Innovation, Swiss National Science Foundation, Singapore A*STAR
Scientific Advisory Board Member for Pacific Northwestern National Lab EMSL
Member-at-large (Elected) for Battery Division of the Electrochemical Society (>1500 members), USA, 2010-1012
Treasurer (Elected) for Battery Division of the Electrochemical Society, USA, 2014-2016. Successfully raised funding for KM Abraham Student Travel Awards and MTI Postdoc Research Awards.
Secretary (Elected) for Battery Division of the Electrochemical Society, USA, 2016 – 2018
Vice Chair (Elected) for Battery Division of the Electrochemical Society, USA, 2018 – now
Executive Board Member and Treasurer for International Battery Association (IBA), 2017 - now
Lead Organizer –

- Chairperson for International Battery Association IBA2019 http://iba-2019.org/ Annual Meeting, La Jolla, March 3-8th, 2019.
- Symposium "Lithium Ion Batteries", Electrochemical Society (ECS) 234th Meeting, Cancun Mexico, October 1-5th, 2018.
- US China Electric Vehicle Battery Technology Workshop, La Jolla, CA, April 8-10th, 2018, 2018.
- Symposium "Lithium Ion Batteries", Electrochemical Society (ECS) 232nd Meeting, National Harbor MD, October 1-5th, 2017.
- Ceramics for Energy Workshop, Sponsored by National Science Foundation, San Diego, June 3-4th, 2016.
- Symposium "High-Energy Li-Ion Intercalation Materials", Electrochemical Society (ECS) 228th Meeting, Phoenix AZ, Oct 11-15, 2015.
- Symposium "Lithium Ion Batteries", Electrochemical Society (ECS) Fall 226th Meeting, Cancun, Mexico, October 6-10th, 2014.
- Symposium "Batteries and Fuel Cell Technologies: Challenges and Solutions Towards Global Stewardships" 248th American Chemical Society ACS National Meeting and Exhibition, San Francisco, USA, August 10-14th, 2014.
- Symposium N "Frontier in Energy Storage", Materials Research Society (MRS), San Francisco, USA, April 20-25th, 2014.
- Symposium on "Computation Science on Battery Materials", Electrochemical Society (ECS) Fall 224th meeting, San Francisco, USA, October 27-November 1, 2013.
- Symposium on "Design and Modeling of Battery Materials**",** Electrochemical Society (ECS) Spring 223rd meeting, Toronto, Canada, May 12-14, 2013.
- Advances in Batteries, American Chemical Society (ACS) Fall Meeting, Philadelphia, August 23-24th, 2012.
- Intercalation Compounds Symposium B4, **Electrochemical Society (ECS)** Fall 222nd meeting, Honolulu, October 7-12, 2012.
- Functional Ceramics for Energy Storage & Conversion for the Electronic Materials and Applications (EMA) 2011 Conference, Orlando January 19-21, 2011.
- International Lecture Series on Materials Design and Development for Energy Storage and Conversion, Taipei May15-18, 2006

Co-Organizer – Symposium A03 Li ion Battery, 233rd Electrochemical Society Meeting (ECS) Seattle, May 2018. Symposium S6 for 37th International Conference and Expo on Advanced Ceramics and Composites (ICACC), Daytona, Jan 27- Feb 1, 2013. Symposium B6 for Electrochemical Society Meeting (ECS), Boston, October 9-14th, 2011. Symposium L for Materials Research Society Meeting

(MRS), April 25-29th, 2011. Symposium B8 for Electrochemical Society Meeting (ECS), Las Vegas, October 11-14th, 2010. Functional Ceramics for Energy Storage & Conversion (Symposium 5) for the Electronic Materials and Applications (EMA) Conference, Orlando January 20-22nd, 2010.
Faculty Advisor – Society for Green Mobility, University of Florida, 2008-2009
Founding Faculty Advisor – ECS Student Chapter, UCSD, 2014 – present (founded in June 2014)

h. Collaborators and Co-Editors

Dr. Clare P. Grey (SUNY Stony Brook, USA and Cambridge University, UK), Dr. Krystyn Van Vilet and Dr. Yang Shao-Horn (Massachusetts Institute of Technology, USA) Dr. Nancy Dudney, Dr. Gabriel Veith and Dr Miaofang Chi (Oak Ridge National Laboratory, USA) Dr. Bing-Joe Hwang (National Taiwan University of Science and Technology) Dr. Jordi Cabana (University of Illinois Chicago, USA) Dr. Quan Li (Chinese Hong Kong University, China) Dr. Anton Van der Ven (UC Santa Barbara) Dr. Sungho Jin, Dr. Joseph Wang, Dr. Oleg Shpyrko, Dr. ShyuePing Ong, Dr. Michael Sailor, Dr. Seth Cohen, Dr. Eric Fullerton (UC San Diego) Dr. Elena Arroyo (University of Madrid, Spain) Dr. Feng Wang, Dr. Huolin Xin, Dr. Yimei Zhu and Dr. Xiao-Qing Yang (Brookhaven National Laboratory, USA) Dr. Karena Chapman and Dr. Ross Harder (Argonne National Lab, USA), Dr. Stanley Whittingham (State University of New York, Binghamton, USA) Dr. Dan Steingart (Princeton University, USA) Dr. Haimei Zheng and Dr. Marca Doeff (Lawrence Berkley National Lab, USA) Dr. Chuan Wu (Beijing Institute of Technology, China) Dr. Andrej Singer (Cornell University) Dr. Feng Lin (Virginia Tech University)

i. Media Coverage

About Zero Carbon Future
https://www.universityofcalifornia.edu/news/achieving-zero-carbon-future
About New Research Direction
https://www.inverse.com/article/51558-could-the-future-be-powered-by-salt-this-researcher-thinks-it-s-possible
https://www.sciencedaily.com/releases/2017/06/170615142736.htm
https://www.sciencedaily.com/releases/2016/07/160706175335.htm
http://jacobsschool.ucsd.edu/news/news_releases/release.sfe?id=2042
https://www.electrochem.org/the-future-of-batteries/?utm_source=Informz&utm_medium=Email&utm_campaign=ECS+Website
About SPEC Center
http://jacobsschool.ucsd.edu/news/news_releases/release.sfe?id=1998
http://www.kpbs.org/news/2015/oct/15/san-diego-researchers-push-build-better-batteries/
http://ucsdnews.ucsd.edu/pressrelease/uc_san_diego_part_of_new_doe_consortium_to_revolutionize_electric_car_batte
Guest appearance on NOVA documentary Aired February 1, 2017 on PBS
http://www.pbs.org/wgbh/nova/tech/super-battery.html
Inside Innovation
https://www.youtube.com/watch?v=6WSwyBs0axc&feature=youtu.be
Sodium Ion Batteries – funded by NSF
https://www.inverse.com/article/51558-could-the-future-be-powered-by-salt-this-researcher-thinks-it-s-possible
Times magazine
https://time.com/4970269/batteries-next-target-china-clean-energy-conquest/
Physics today
https://physicstoday.scitation.org/doi/10.1063/PT.3.4359?af=R&feed=most-recent