Daniel A. Steingart

Stanley-Thompson Professor of Chemical Metallurgy and Chemical Engineering
Earth and Environmental Engineering
Chemical Engineering
Co-Director Columbia Electrochemical Energy Center
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Researcher in application and cost centered materials, systems, and characterization for electrochemical energy storage with an emphasis on electroplating metal chemistry, systematic irreversibility and electrochemical acoustic time of flight analysis.

Professional Preparation

- University of California, Berkeley, Materials Science and Engineering, PhD, 2006
    - Thesis: *Printed On-Chip Electrochemical Storage*
- University of California, Berkeley, Materials Science and Engineering, MS, 2002
    - Thesis: *An Experimental and Computational Study of Granular Zinc Flow in Two Dimensional Hoppers*
- Brown University, Engineering, ScB (Honors), 2000
    - Thesis: *Dynamic Failure Modes of Beryllium Bearing Bulk Amorphous Metal Matrix Tungsten Composites*

Professional Appointments

- Professor, Columbia University, 2022 - Current
    - Department of Earth and Environmental Engineering
    - Department of Chemical Engineering
    - Columbia Electrochemical Energy Center
- Independent Director, FREYR Battery, 2022 - Current
- Chief Scientist, Electra, 2021 - 2022
- Associate Professor, Columbia University, 2019 - 2022
    - Department of Earth and Environmental Engineering
    - Department of Chemical Engineering
    - Columbia Electrochemical Energy Center
- Associate Professor, Princeton University, 2017 - 2019
    - Department of Mechanical and Aerospace Engineering
    - Andlinger Center for Energy and the Environment
- Co Founder, Feasible, 2015 - 2022

- Associated Faculty, Princeton University, 2018 - 2019
    - Department of Chemistry
- Associated Faculty, Princeton University, 2016 - 2019
    - Department of Chemical Engineering
- Assistant Professor, Princeton University, 2013 - 2017
    - Department of Mechanical and Aerospace Engineering
    - Andlinger Center for Energy and the Environment
- Assistant Professor, City College of the City University of New York, 2009 - 2013
    - Department of Chemical Engineering
- Senior Applications Engineer, Sentilla Corporation, 2008 - 2008
- Co Founder, WIT, 2006 - 2008

Awards and Honors

- Stanley Thompson Professor in Chemical Metallurgy, Columbia University (2019)
- Best Tweet, Princeton University (2018)
- National Academy of Engineering Japan-USA Frontiers of Engineering Speaker (2016)
- National Academy of Engineering Frontiers of Engineering Organizer (2014)
- National Academy of Engineering Frontiers of Engineering Invitee (2013)
- Nuclear Regulatory Commission Young Investigator Award (2012)
- Xerox University Affairs Committee Award (2012)
- Best Poster US-Korea Nanotechnology Conference (2012)
- International Solid-State Circuits Conference Design Award for Picocube (2008)
- Japan Society for the Promotion of Science Summer Fellow (2005)
- National Science Foundation East Asia and Pacific Summer Institutes Fellow (2005)
- Cubicciotti Student Award - Electrochemical Society (2005)
- Intel Robert Noyce Graduate Fellowship (2003)
- University of California, Berkeley Haas School of Business Management of Technology Fellowship (2002)
- University of California, Berkeley Materials Science and Engineering Jane Lewis Student Graduate Fellowship (2000)

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** indicates sole corresponding author, ^ indicates co-corresponding author, underline indicates author a primary advisee of Steingart*

Peer Reviewed Journal Articles

69. * W. Change, T. Xu, D. A. Steingart (2022) 'Chemo-Mechanical Effects of Stack Pressure and Temperature on Anode-Free Lithium Metal Batteries', *Journal of the Electrochemical Society*, doi: 10.1149/1945-7111/ac91a9
68. R. Osterbacka*, Y. Bonnassieux, C. Brabec, Y. Cao, T. Carmichael, M. Chabinyc, K. Cheng, G. Cho, A. Chung, C. Cobb, A. Distler, H. Egelhaaf, G. Grau, X. Guo, G. Haghiashtiani, T. Huang, M. Hussain, B. Iniguez, T. Lee, L. Li, Y. Ma, D. Ma, M. McAlpine, T. N. Ng, S. Patel, J. Peng, H. Peng,

J. Rivnay, L. Shao, D. A. Steingart, R. Street, V. Subramanian, L. Torsi, Y. Wu (2021) 'The 2021 Flexible and Printed Electronics Roadmap', *Flexible and Printed Electronics*, doi: 10.1088/2058-8585/abf986

67. * D. A. Steingart (2021) 'Thermo/Physical Abuse Couplings in Batteries: From Electrodes to Cells', *MRS Bulletin*, doi: 10.1557/s43577-021-00108-1
66. * W. Chang, D. A. Steingart (2021) 'Operando 2D Acoustic Characterization of Lithium-ion Battery Spatial Dynamics', *ACS Energy Letters*, doi: 10.1021/acsenergylett.1c01324
65. ^ W. Chang, R. May, M. Wang, J. Sakamoto, L. Marbell, D. A. Steingart (2021) 'Evolving Contact Mechanics and Microstructure Formation Dynamics of the Lithium Metal-Li7La3Zr2O12 (LLZO) Interface', *Nature Communications*, doi: 10.1038/s41467-021-26632-x
64. * T. Hodson, S. Patil, D. A. Steingart* (2021) 'An Initial Exploration of Coupled Transient Mechanical and Electrochemical Behaviors in Lithium Ion Batteries', *Journal of the Electrochemical Society*, doi: 10.1149/1945-7111
63. * W. Chang, C. Bommier, R. Mohr, D. A. Steingart* (2021) 'Impact of Non-Arrhenius Temperature Behavior on the Fast-Charging Capabilities of LiCoO2Graphite Lithium-Ion Batteries', *Journal of Physical Chemistry C*, doi: 10.1021/acs.jpcc.0c09972
62. C. Yu, K. Kam, Y. Xu, Z. Cui, D. A. Steingart, M. Gorlatova, P. Culligan, Ioannis Kymissis* (2020) 'Plant Spike: A Low-Cost, Low-Power Beacon for Smart City Soil Health Monitoring', *IEEE Internet of Things Journal*, doi: 10.1109/JIOT.2020.3003479
61. * W. Chang, R. Mohr, A. Kim, K. Denner, G. Davies, J. H. Park, D. A. Steingart* (2020) 'Measuring effective stiffness of Li-ion batteries via acoustic signal processing', *Journal of Materials Chemistry A*, doi: 10.1039/d0ta05552b
60. * W. Chang, J. H. Park, N. Dutta, C. Arnold, D. A. Steingart* (2020) 'Morphological and Chemical Mapping of Columnar Lithium Metal', *Chemistry of Materials*, doi: 10.1021/acs.chemmater.9b04385
59. * C. Bommier, W. Chang, Y. Lu, J. Yeung, G. Davies, D. A. Steingart* (2020) 'In-Operando Acoustic Detection of Li Metal Plating in Commercial LCO/Graphite Pouch Cells', *Cell Reports Physical Sciences*, doi: 10.1016/j.xcrp.2020.100035
58. M. Ruiz-Urigen, D. A. Steingart, P. R. Jaffe* (2019) 'Oxidation of ammonium by Feammox Acidimicrobiaceae sp. A6 in anaerobic microbial electrolysis cells', *Environmental Science: Water Research & Technology*, doi: 10.1039/D0EW00408A
57. * C. Bommier, W. Chang, T. Fair, J. Yeung, D. A. Steingart (2019) 'Understanding Adverse Effects of Temperature Shifts on Li-Ion Batteries: An Operando Acoustic Study', *Journal of The Electrochemical Society*, doi: 10.1149/ 1945-7111/ab6c56
56. * C. Bommier, W. Chang, J. Li, S. Biswas, J. Nanda, D. A. Steingart* (2019) 'In-Operando Acoustic Monitoring of SEI Formation and Long Term Cycling in NMC/SiGr Composite Pouch Cells', *Journal of The Electrochemical Society*, doi: 10.1149/1945-7111/ab68d6
55. * R. E. Ciez, D. A. Steingart* (2019) 'Asymptotic Cost Analysis of Intercalation Lithium Ion Systems for Multi-Hour Duration Energy Storage', *Joule*, doi: 10.1016/j.joule.2020.01.007
54. C. Abram, J. Shan, X. Yang, C. Yan, D. A. Steingart, Y. Ju* (2019) 'Flame Aerosol Synthesis and Electrochemical Characterization of Ni-Rich Layered Cathode Materials for Li-Ion Batteries', *ACS Applied Energy Materials*, doi: 10.1021/acsaem.8b01892
53. * W. Chang, J. H. Park, D. A. Steingart* (2018) 'Poor Man's Atomic Layer Deposition of LiF for Additive-Free Growth of Lithium Columns', *Nano Letters*, doi: 10.1021/acs.nanolett.8b03070
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51. * A. Raj, D. A. Steingart* (2018) 'Review-Power Sources for the Internet of Things', *Journal of The Electrochemical Society*, doi: 10.1149/2.0181808jes
50. D. Lei, D. Lee, E. Zhao, A. Amagsinski, H. Jung, G. Berdichevsky, D. A. Steingart, G. Yushin* (2018) 'Iron oxide nanoconfined in carbon nanopores as high capacity anode for rechargeable alkaline batteries', *Nano Energy*, doi: 10.1016/j.nanoen.2018.03.035

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45. * K. W. Knehr, S. Biswas, D. A. Steingart* (2017) 'Quantification of the Voltage Losses in the Minimal Architecture Zinc-Bromine Battery Using GITT and EIS', *Journal of The Electrochemical Society*, doi: 10.1149/2.0821713jes
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43. ^ J. H. Park, D. A. Steingart^, S. Kodambaka^, F. M. Ross^ (2017) 'Electrochemical electron beam lithography: Write, read, and erase metallic nanocrystals on demand', *Science Advances*, doi: 10.1126/sciadv.1700234
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24. Y. L. Kong, I. A. Tamargo, H. Kim, B. N. Johnson, M. K. Gupta, T. Koh, H. Chin, D. A. Steingart, B. P. Rand, M. C. McAlpine^ (2014) '3D Printed Quantum Dot Light-Emitting Diodes', *Nano Letters*, doi: 10.1021/nl5033292
23. ^ D. Desai, X. Wei, D. A. Steingart^, S. Banerjee^ (2014) 'Electrodeposition of preferentially oriented zinc for flow-assisted alkaline batteries', *Journal of Power Sources*, doi: 10.1016/j.jpowsour.2014.01.026
22. ^ J. W. Gallaway^, C. K. Erdonmez, Z. Zhong, M. Croft, L. A. Sviridov, T. Z. Sholklapper, D. E. Turney, S. Banerjee, D. A. S. ^ (2014) 'Real-time materials evolution visualized within intact cycling alkaline batteries', *Journal of Materials Chemistry A*, doi: 10.1039/C3TA15169G
21. * B. Hertzberg, L. Sviridov, E. A. Stach, T. Gupta, D. A. Steingart* (2014) 'A Manganese-Doped Barium Carbonate Cathode for Alkaline Batteries', *Journal Of The Electrochemical Society*, doi: 10.1149/2.165083405jes
20. ^ J. W. Gallaway^, A. M. Gaikwad, B. J. Hertzberg, C. K. Erdonmez, Y. K. Chen-Wiegart, L. A. Sviridov, K. Evans-Lutterodt, J. Wang, S. Banerjee, D. A. Steingart^ (2014) 'An In Situ Synchrotron Study of Zinc Anode Planarization by a Bismuth Additive', *Journal Of The Electrochemical Society*, doi: 10.1149/2.037403jes
19. ^ D. Desai, D. E. Turney, B. Anantharaman, D. A. Steingart^, S. Banerjee^ (2014) 'Morphological Evolution of Nanocluster Aggregates and Single Crystals in Alkaline Zinc Electrodeposition', *Journal of Physical Chemistry C*, doi: 10.1021/jp411104a
18. B. J. V. Tassell, S. Yang, C. Le, L. Huang, S. Liu, P. Chando, A. Byro, X. Liu, D. L. Gerber, E. S. Leland, S. Sanders, P. R. Kinget, Ionaniss, Kymissis, D. A. Steingart, D. A. S. OBrien^ (2013) 'Structure and performance of dielectric films based on self-assembled nanocrystals with a high dielectric constant', *Nanotechnology*, doi: 10.1088/0957-4484/24/41/415602
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potential printed battery for powering printed electronics', *Applied Physics Letters*, doi: 10.1063/1.4810974

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15. * A. M. Gaikwad, A. M. Zamarayeva, J. Rousseau, H. Chu, I. N. Derin, D. A. Steingart* (2012) 'Highly stretchable alkaline batteries based on an embedded conductive fabric', *Advanced Materials*, doi: 10.1002/adma.201201329
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7. * D. A. Steingart*, S. Roundy, P. K. Wright, J. W. Evans (2008) 'Micropower Materials Development for Wireless Sensor Networks', *MRS Bulletin*, doi: 10.1557/mrs2008.81
6. B. Otis, S. Gambini, R. Shah, D. A. Steingart, E. Quevy, J. Rabaey, A. Sangiovanni-Vincentelli, P. K. Wright* (2007) 'Modelling and simulation techniques for highly integrated, low-power wireless sensor networks', *Institution of Engineering and Technology Computers & Digital Techniques*, doi: 10.1049/iet-cdt:20050214
5. P. Marcolongo, J. W. Evans*, D. A. Steingart (2007) 'A Novel, Inexpensive, and Rugged Probe for Measuring Gas Bubbles in Liquid Metals: Part I. Mathematical Modeling and Laboratory Experiments', *Metallurgical and Materials Transactions B.*, doi: 10.1007/s11663-007-9053-2
4. D. A. Steingart, J. W. Evans* (2007) 'Measurements of granular flows in two-dimensional hoppers by particle image velocimetry. Part II: Simulation of granular flow in 2-D hoppers using the Caram-Hong model', *Chemical Engineering Science*, doi: 10.1016/j.ces.2005.04.011
3. D. A. Steingart, A. Redfern, C. C. Ho, P. K. Wright, J. W. Evans* (2006) 'Jonny Galvo: A Small, Low Cost Wireless Galvanostat', *Electrochemical Society Transactions*, doi: 10.1149/1.2218987
2. D. A. Steingart, J. W. Evans* (2005) 'Measurements of granular flows in two-dimensional hoppers by particle image velocimetry. Part I: experimental method and results', *Chemical Engineering Science*, doi: 10.1016/j.ces.2004.09.066
1. K. Jian, H. Shim, D. Tuhus-Dubrow, S. Bernstein, C. Woodward, M. Pfeffer, D. A. Steingart, T. Gournay, S. Sachsman, G. PCrawford, R. HHurt* (2003) 'Liquid crystal surface anchoring of mesophase pitch', *Carbon*, doi: 10.1016/S0008-6223(03)00203-3

Articles In Review and Preparation

8. * R. E. Ciez, D. A. Steingart* (2023) 'Consideration of Operating Cost vs. Round Trip Efficiency for Long Duration Storage Applications', *Nature Energy*, *In Preparation*

7. ^ M. S. Williams, E. Palermo, A. C. West, D. A. Steingart (2023) 'Anodic dissolution of Zinc into Water-In-Salt ZnBr2 Electrolytes', *Journal of the Electrochemical Society*, *In Preparation*
6. * D. A. Steingart (2023) 'Considering Solvent Consumption in Batteries (Invited Perspective)', *Journal of the American Chemical Society*, *In Preparation*
5. * R. Mohr, M. Williams, G. L. O', A. C. West, D. A. Steingart* (2023) 'Stability of amorphous carbons in oxidizing halogen conditions', *Journal of the Electrochemical Society*, *In Preparation (on hold as patent processes)*
4. * R. Mohr, M. Williams, G. L. O', A. C. West, D. A. Steingart* (2023) 'Understanding the role of multivalent supporting cations on zinc deposition', *Journal of the Electrochemical Society*, *In Preparation (on hold as patent processes)*
3. * R. Mohr, M. Williams, G. L. O', A. C. West, D. A. Steingart* (2023) 'Effect of Speciation on Zinc/Bromine Redox on Carbon Electrodes', *Journal of the Electrochemical Society*, *In Preparation (on hold as patent processes)*
2. * R. Mohr, M. Williams, G. L. O', A. C. West, D. A. Steingart* (2023) 'Modeling Density Driven Electrochemically Induced Flows', *Journal of the Electrochemical Society*, *In Preparation (on hold as patent processes)*
1. * D. A. Steingart (2021) 'Decoupling Coulombic Efficiency from Cycle Life in Electrochemical Energy Storage (Invited Perspective)', *Nature Communications*, *In Preparation*

Patents

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13. D. A. Steingart, G. Davies, S. Biswas, A. G. Hsieh, B. Van_Tassell, T. Hodson, S. Dou (2018) 'Determination of Characteristics of electrochemical systems using acoustic signals', pending, The Trustees of Princeton University, US20190072614
12. D. A. Steingart, A. Gaikwad (2017) 'Printed Flexible Battery', pending, Research Foundation of the City University of New York, US20180166699
11. D. A. Steingart, B. Hertzberg, M. Chamoun, G. Davies, Y. S. Meng (2016) 'Alkaline Battery Electrolyte Useful for a Rechargeable Alkaline Electrochemical Cell', pending, The Trustees of Princeton University, US20170348728
10. B. Van_Tassell, D. A. Steingart, E. S. L. P. Chando, L. Huang, S. O'Brien (2017) 'Prevention of Hydrophobic Dewetting Through Nanoparticle Surface Treatment', pending, Research Foundation of the City University of New York, US20170348728
9. T. Sholklapper, J. Gallaway, D. A. Steingart, N. Ingale, M. Nyce (2016) 'Alkaline battery operational methodology', pending, Research Foundation of the City University of New York, US9419289
8. S. Banerjee, Y. Ito, M. Klein, M. E. Nyce, D. A. Steingart, R. Plivelich, J. W. Gallaway (2016) 'Nickel-zinc flow battery', pending, Research Foundation of the City University of New York, US9379373
7. J. W. Evans, M. H. Schneider, D. A. Steingart, P. K. Wright, D. P. Ziegler (2008) 'Wireless sensing node powered by energy conversion from sensed system', grant, University of California, Alcoa, US7466240B2
6. D. A. Steingart, J. W. Evans (2012) 'Determining electrical current using at least two sensors at a known distance from each other', grant, Wireless Industrial Technologies, US8125214B1
5. D. A. Steingart, S. Bhadra, A. G. Hsieh, B. Hertzberg, P. J. Gjeltema, C. W. Rowley, A. S. R. Goy, J. W. Fleischer (2018) 'Apparatus and method for determining state of change (SOC) and state of health (SOH) of electrical cells', grant, The Trustees of Princeton University, US10132781B2
4. A. G. Hsieh, A. Wilkinson, R. C. Mohr, S. Biswas, B. J. Van_Tassell, D. A. Steingart (2018) 'Acoustic testing of batteries in portable devices', pending, Feasible Inc,, US20190094189A1
3. S. Biswas, R. C. Mohr, A. G. Hsieh, B. J. Van_Tassell, D. A. Steingart (2018) 'Modular, adaptable holders for sensors and battery cells for physical analysis', pending, Feasible Inc,,

US20180123189A1

2. D. A. Steingart, S. Biswas, T. M. Hodson, A. Senju, R. C. Mohr (2016) 'Membrane-free minimal architecture zinc bromine battery with bromine-trapping composite carbon foam electrode', pending, The Trustees of Princeton University, WO2018071469A1
1. E. Bachmann, J. Tromp, G. Davies, D. A. Steingart (2017) 'Quantitative ultrasound imaging based on seismic full waveform inversion', pending, The Trustees of Princeton University, WO2019046550A1

Invited Departmental Presentations

27. 'Of Density and Destiny', Colorado School of Mines, Golden, CO, 20210429
26. 'Power From Chemistry', Queens College, Queens, NY, 20190306
25. 'Exploring and Exploiting Often Unwanted Coupling in Closed Electrochemical Energy Cells', Stevens Institute, Hoboken, NJ, 20180915
24. 'Exploring and Exploiting Often Unwanted Coupling in Closed Electrochemical Energy Cells', New Jersey Institute of Technology ChE Seminar, Jersey City, NJ, 20180218
23. 'The Unfortunate Tetrahedron', University of Washing CEI Seminar, Seattle, WA, 20171102
22. 'Exploring and Exploiting Often Unwanted Coupling in Closed Electrochemical Energy Cells', University of Pennsylvania MEAM Seminar, Philadelphia, PA, 20171024
21. 'Electrochemical Acoustic Time of Flight Analysis', Medtronic Energy Systems Technical Forum, St. Paul, MN, 20160628
20. 'Hidden in Plain Sight', Brown University Materials Science and Solid Mechanics Seminar, Providence, RI, 20160509
19. 'Negotiating with Batteries', Argonne National Lab Center for Nanomaterials, Chicago, IL, 20160503
18. 'Negotiating with Batteries', University of Chicago Institute for Molecular Engineering Seminar, Chicago, IL, 20160226
17. 'Negotiating with Batteries', University of Rochester Mechanical Engineering / Center for Energy and the Environment Seminar, Rochester, NY, 20160205
16. 'Negotiating with Batteries', Oak Ridge National Lab Computer Science Seminar, Oak Ridge, TN, 20160221
15. 'Learning New Things from Old Chemistries: Revisiting Ideas Before Lithium Ion', Massachusetts Institute of Technology Materials Science and Engineering Seminar, Cambridge, MA, 20150724
14. 'Metal Processing Technologies for Energy Storage Devices', Columbia University Earth and Environmental Engineering Seminar, New York, NY, 20150502
13. 'Old Batteries for New Problems', Drexel Materials Science and Engineering Seminar, Philadelphia, PA, 20150115
12. 'Wearing a Battery', University of Michigan EE Seminar, Ann Arbor, MI, 20141117
11. 'Alkaline Batteries in 2014', RPI Materials Science and Engineering Seminar, Troy, NY, 20140903
10. 'New Tricks for Old Batteries', UPenn Materials Science and Engineering Seminar, Philadelphia, PA, 20140326
9. 'Zn MnO2 Batteries For Large Scale Electrical Energy Storage', Brookhaven National Lab EERE Seminar, Upton, NY, 20131010
8. 'The Quest for the 100000 Cycle Battery', Princeton University MAE Seminar, Princeton, NJ, 20120322
7. 'The Quest for the 100000 Cycle Battery', Princeton University PRISM Seminar, Princeton, NJ, 20120215
6. 'Zn MnO2 Batteries For Large Scale Electrical Energy Storage', Sandia National Lab CINT Seminar, Albuquerque, NM, 20110322
5. 'Zn MnO2 Batteries For Large Scale Electrical Energy Storage', University of Michigan Materials Science and Engineering Seminar, Ann Arbor, MI, 20110223
4. 'Flow Assist Batteries', University of California Berkeley Materials Science and Engineering Seminar, Berkeley, CA, 20100910

3. 'Low Cost Extruded Batteries', PARC HRL Seminar, Palo Alto, CA, 20100909
2. 'Flow Assist Batteries', Drexel ME Seminar, Philadelphia, PA, 20100423
1. 'Flow Assist Batteries', Rutgers Materials Science and Engineering Seminar, Piscataway, NJ, 20100223

Invited Conference Presentations

43. 'GRC Batteries (TBD)', GRC, Ventura, CA, 20220605
42. 'ARPA-E Summit Pitch Day', ARPA-E Summit, Denver, CO, 20220516
41. 'Thermophysical Safety Challenges in Batteries', MRS Webinar Series, Zoom, , 20210526
40. 'MOST DAYS', ARPA-E Summit, Zoom, , 20210524
39. 'Of Density and Destiny', Oxford Battery Symposium, Zoom, , 20210315
38. 'Electrochemical Acoustic Time of Flight Characterization of Batteries', ECS Webinar Series, Zoom, , 20201203
37. 'Negative Couples and Dendritic Behavior of Zinc', MRS Fall 2020, Zoom, , 20201202
36. 'Physical Chemical Battery Analysis for Safety Diagnosis', UL Battery Safety Series, Zoom, , 20201116
35. 'Passive Zn Br Batteries', ICL IP, Tel Aviv, IL, 20200117
34. 'Acoustic Response of Batteries', Gotion, Hefei, CN, 20191205
33. 'Primary Electrodeposition of Lithium Metal for Secondary Batteries', Electrochemical Society, Atlanta, GA, 20191016
32. 'Acoustic Detection of Unwanted Lithium Deposition in Lithium Ion Batteries', Electrochemical Society, Atlanta, GA, 20191014
31. 'Acoustics and Batteries', International Lithium Ion Battery Conference, San Diego, CA, 20190415
30. 'Exploiting The Unwanted', The Material Minerals and Metals Society Annual Meeting, Phoenix, AZ, 20180429
29. 'Living Forever By Dying Everyday', Materials Research Society, Phoenix, AZ, 20170420
28. 'Transitioning Electrochemical Acoustic Analysis into a Predictive Technique for Understanding Complex Behaviors', Meeting The Challenge ESS, Santa Fe, NM, 20170222
27. 'Progress in Electrochemical Acoustic Time of Flight Analysis', American Institute of Chemical Engineering, San Francisco, CA, 20161115
26. 'Acute vs. Chronic Safety Concerns in Energy Storage', Battery Safety Meeting, Bethesda, MD, 20161103
25. 'Listening to Batteries', Le Studium Future of Electrochemical Energy Storage Systems, Tours, France, 20160926
24. 'Electrochemical Acoustic Time of Flight Analysis', Telluride Science Research Conference, Telluride, CO, 20160725
23. 'Balancing Nanostructured Transport with Increased Reactivity in Electrochemical Energy Storage System', National Academy of Engineering Japan-US Frontiers of Engineering, Irvine, CA, 20160617
22. 'Negotiating with Batteries', Beyond Lithium Ion IX, Richland, WA, 20160525
21. 'Electrochemical Acoustic Time of Flight', Materials Research Society, San Francisco, CA, 20160401
20. 'Hidden in Plain Sight', Gordon Research Conference Batteries, Ventura, CA, 20160225
19. 'Flexible Power', ASME InterPACK, San Francisco, CA, 20150707
18. 'Wearable Batteries', New York Times International Luxury Conference, Miami, FL, 20141202
17. 'Batteries Included', Zeropower New York Fashion Week, New York, NY, 20140603
16. 'React in Place Spray Battery Electrodes', Electrochemical Society, Cancun, MX, 20141006
15. 'Compliant Power Supplies', Hewlett Packard Taipei Power Supplies Conference, Taipei, Taiwan, 20140603
14. 'Compliant Energy Storage', Hewlett Packard Taipei Power Supplies Conference, Taipei, Taiwan, 20140602

13. 'Energy Storage in Fabric', European Materials Research Society Spring, Lille, France, 20140529
12. 'Potential Roles Of Electron Microscopy In The Study Of Electrochemical Storage', Lawrence Berkeley National Lab Joint Center for Energy Storage Research Seminar, Berkeley, CA, 20130528
11. 'Batteries Included Adding Energy Without Disrupting Utility', Materials Research Society Fall 2013, Boston, MA, 20131203
10. 'Complementary In Situ And In Operando Studies Of Complex Energy Storage Systems Leveraging Low Cost and Abundant Materials', Materials Research Society Fall 2013, Boston, MA, 20131203
9. 'Deposition Considerations For Large Scale Electrical Energy Storage', Gordon Research Conference Crystal Growth And Thin Film Deposition, Biddeford, ME, 20130711
8. 'Failing Fast and Often', Advanced Research Projects Agency for Energy Summit, Washington, DC, 20130226
7. 'Printed Batteries For Cloth Computing', International Conference On Flexible And Printed Electronics, Tokyo, Japan, 20120905
6. 'Using Low Cost Materials For Grid Energy Storage Applications', Materials Research Society International Conference Of Young Researchers On Advanced Materials, Singapore, Singapore, 20120703
5. 'The Quest For The 100000 Cycle Battery', US-Korean Nanotechnology Conference, Seoul, Korea, 20120603
4. 'System Sympathetic Flexible Energy Storage And Electricity Conversion', Materials Research Society Meeting, San Francisco, CA, 20120411
3. 'Stretchable Alkaline Batteries', Materials Research Society Meeting, Boston, MA, 20111203
2. 'Flow Assist Batteries', US-Taiwan Energy Storage Workshop, Taipei, Taiwan, 20111203
1. 'Wireless Sensor Networks for Energy and Process Monitoring', Materials Research Society Meeting, San Francisco, CA, 20090410

Contributed Conference Presentations

75. 'Voltage Loss in Minimal Architecture Zinc-Bromine Batteries', Raj, A., Park, J.H., Steingart, D.,, Electrochemical Society Fall Meeting, 2017
74. 'Studying Break-in Phenomena in Lithium-Ion Batteries through Acoustic and Impedance Measurements', Knehr, K., Biswas, S., Huynh, H., Steingart, D.,, Electrochemical Society Fall Meeting, 2017
73. 'Electrochemical Acoustic Structural Determination of Lithium Ion Batteries', Hodson, T. Knehr, K. Steingart, D.,, Spring MRS Meeting, Phoenix AZ, 2017
72. 'Safety Considerations for Zinc Bromine Batteries', Steingart, D.A., Electrochemical Society Fall Meeting, 2016
71. 'Static Zinc Bromine Batteries for Grid Scale Energy Storage', Steingart, D.A., Electrochemical Society Fall Meeting, 2016
70. 'Dendrites as positive structures in batteries', Hodson, T, Steingart D.A., Electrochemical Society Fall Meeting, 2016
69. 'An Overview of EAToF Analysis', Gupta, T.A., Steingart, D. A., Electrochemical Society Fall Meeting, 2016
68. 'Modeling Electrochemical Acoustic Time of Flight Behavior', Steingart D. A., Electrochemical Society Fall Meeting, 2016
67. 'In Operando and Chemistry Agnostic Mechanical Acoustic Analysis of Closed Electrochemical Cells through Acoustic Interrogation', Davies, G. L., Steingart D. A.,, Materials Research Society Spring Meeting, 2016
66. 'Low-Cost, Pump-Free, Membrane-Free and Highly Dynamic', Steingart, D. A., Bhadra, S., Hsieh, A., Materials Research Society Spring Meeting, 2016
65. 'In Operando Investigation of Rechargeable Batteries Using Electrochemical-Acoustic Time-of-Flight Analysis', Steingart, D. A., Biswas, S., Yang, X., Hodson T., Senju, A., Mohr, R, Koel B,, Materials Research Society Fall Meeting, 2015

64. 'Determination of Materials Differences between Alkaline AA Battery Brands Using In Operando Electrochemical-Acoustic Time-of-Flight Analysis', Hsieh, A., Steingart, D. A., Bhadra, S., Wang M., Materials Research Society Fall Meeting, 2015
63. 'In-Situ Imaging of Hyperdendritic Zinc Electrode during Electrochemical Cycling at Micro and Nano Scales', Steingart, D. A., Hsieh, A., Bhadra, S., Wang M., Materials Research Society Fall Meeting, 2015
62. 'Automated Fabrication of Prussian Blue Analog Batteries on Fiber Substrates for Wearable Electronics', Biswas, S., Gupta, T., Steingart, D. A., Materials Research Society Fall Meeting, 2015
61. 'Fabrication of High Performance Flexible Silver-Zinc Wire Battery for Wearable Applications', Kim, A., Gupta, T., Biswas S., Steingart D.,, Materials Research Society Fall Meeting, 2015
60. 'Real-Time Collection, Visualization, and Processing of Electrochemical-Acoustic Time-of-Flight Data from Battery Cycling Experiments', Zamarayeva, A., Delchovsky, I., Davies, G., Wang, M., Steingart, D. A., Arias, A., Materials Research Society Fall Meeting, 2015
59. 'Electrochemical and In Situ Diffraction Studies of Iron Oxide Anodes in Alkaline Electrolytes', Van Tassell, B., Steingart, D. A., Hsieh, A., Bhadra, S., Wang M.,, Materials Research Society Fall Meeting, 2015
58. 'Designs and Operation of Non-Flowing Zinc Bromine Battery with Low-Cost Materials', Rus, E., Moon, G., Erdonmez, CE., Steingart D., Materials Research Society Fall Meeting, 2015
57. 'Evaluation of Carbon Foams and Membranes As the Cathode in Non-Flow Zinc Bromine Energy Storage Cells to Mitigating Liquid Bromine Convection', Biswas S., Mohr, R., Steingart D.,, Electrochemical Society Fall Meeting, 2015
56. 'Prussian Blue Analog Batteries on Thread Substrates for Wearable Electronic Applications', Biswas S., Mohr, R., Steingart D.,, Electrochemical Society Fall Meeting, 2015
55. 'In Operando Electrochemical-Acoustic Time-of-Flight Analysis: Correlating Physical Dynamics within Batteries to States of Charge and Health', Kim, A., Gupta, T., Biswas S., Steingart D.,, Electrochemical Society Fall Meeting, 2015
54. 'Interrogation of Alkaline AA Batteries Using in Operando Electrochemical Acoustic Time-of-Flight Analysis and in Operando energy Dispersive X-Ray Diffraction', Steingart, D. A., Hsieh, A., Bhadra, S., Wang M.,, Electrochemical Society Fall Meeting, 2015
53. 'Electrochemical Acoustic Time of Flight Analysis', Steingart, D. A., Hsieh, A., Bhadra, S., Wang M.,, Electrochemical Society Fall Meeting, 2015
52. 'Hyper-Dendritic Nanoporous Zinc Foam Anodes', Steingart, D. A., Hsieh, A., Bhadra, S., Wang M., Materials Research Society Spring Meeting, 2015
51. 'Unusual Dramatic Surface Restructuring of Silicon Substrate during Epitaxy', Chamoun, M., Hertzberg, B., Gupta, T., Bhadra, S., Van Tassell, B., Erdonmez, C. and Steingart D., Materials Research Society Spring Meeting, 2015
50. 'An Electrochemical Direct Injection Reactor for Efficient Power Generation from Nanostructured Zinc Fuel', Gupta, T., Steingart, D. A.,Hannon JB., Materials Research Society Spring Meeting, 2015
49. 'Understanding the Influence of Compression on the Long-Term Cycling of Doped-MnO2 Alkaline Batteries', Hsieh, A.G., Davies, G, Steingart, D. A., Materials Research Society Spring Meeting, 2015
48. 'Investigating the Structural Evolution of Doped-MnO2 Alkaline Cells Using In-Situ Raman and Impedance Spectroscopy', Hsieh, A.G., Hertzberg, B.J. , Chamoun, M. , Steingart, D. A.., Materials Research Society Spring Meeting, 2015
47. 'In Situ Synchrotron X-Ray Diffraction Studies of Phase Transitions in Alkaline Battery Cathode Materials', Hsieh, A.G., Hertzberg, B.J. , Chamoun, M. , Steingart, D. A..., Materials Research Society Spring Meeting, 2015
46. 'In-Operando Low Cost Physical Interrogation of Alkaline Batteries', Hertzberg, B.J., Chamoun, M. , Hsieh, A.G., Evans-Lutterodt, K. , Croft, M. , Zhong, Z. , Mohr, R. , Steingart. D., Materials Research Society Spring Meeting, 2015
45. 'Unusual Dramatic Surface Restructuring of Silicon Substrate during Epitaxy', Bhadra, S., Goy, A.

,Gjeltema,P.J. , Fleischer,J.W. , Steingart, D. A.,, APS Meeting, 2015

44. 'Controlled Synthesis of One-Dimensional MnO2 Nanoparticles for Battery Applications and Their Stability in the Presence of Zinc', Gupta, T., Steingart, D. A. and Hannon, J., Materials Research Society Fall Meeting, 2014
43. 'Spray Deposited Wide-Area Multilayer Ceramic Capacitors', Hertzberg, B.J., Phadke, S., Chamoun M., Davies G., Rus E.,Erdonmez C.,Meng S.,Steingart D., Materials Research Society Fall Meeting, 2014
42. 'Bouncing Alkaline Batteries: A Basic Solution', Van Tassell, B., Chando, P.,Yang, S.,Liu, S.,O'Brien S.,Kymissis I.,Steingart D., Materials Research Society Fall Meeting, 2014
41. 'Visualization of Active and Passive Control of Morphology during Electrodeposition', Bhadra, S., Hertzberg, B. J., Van Tassell, B., Gallaway, J. W., Chamoun, M., Erdonmez, C. and Steingart, D. A., Microscopy and Microanalysis Meeting, 2014
40. 'Zinc Dendrite Growth and Control: In Situ Techniques for Visualizing Micro-and Nano-Scale Morphology', Schneider, N. M., Hun Park, J., Grogan, J. M., Kodambaka, S., Steingart, D. A., Ross, F. M. and Bau, H. H., Electrochemical Society Meeting, 2014
39. 'The Promise of Aqueous Chemistry Semi-Solid Flow Cells', Gallaway, J. W., Gaikwad, A., Turney, D., Desai, D., Banerjee, S., Hertzberg, B. J., Steingart, D. A., Chen-Wiegart, Y.-C. K., Evans-Lutterodt, K., Wang, J., Fall Electrochemical Society Meeting, 2014
38. 'Bouncing Alkaline Batteries: A Basic Solution', Davies, G. and Steingart, D. A., Fall Electrochemical Society Meeting, 2014
37. 'Doped Carbonate Alkaline Battery Cathodes', Bhadra, S., Hertzberg, B. J., Van Tassell, B., Gallaway, J. W., Chamoun, M., Erdonmez, C. and Steingart, D. A., Fall Electrochemical Society Meeting, 2014
36. 'Further In Situ EDXRD Studies of the MnO2 Cathode', Hertzberg, B. J., Sviridov, L., Stach, E. A., Mehra, A. and Steingart, D. A., Fall Electrochemical Society Meeting, 2014
35. 'In Situ Electrochemical Measurements in the Nanoaquarium', Steingart, D. A.., Gallaway, J. W., Hertzberg, B. J. and Erdonmez, C., Microscopy and Microanalysis Meeting, 2013
34. 'Transient Interface Evolution in Cycling Alkaline Batteries Resolved Using Synchrotron X-Rays', Schneider, N. M., Park, J. H., Grogan, J. M., Kodambaka, S., Steingart, D. A., Ross, F. M. and Bau, H. H., Fall Electrochemical Society Meeting, 2013
33. 'Coupling In-Situ Techniques to Analyze Zinc Deposition and Dissolution for Energy Storage Applications', Gallaway, J. W., Erdonmez, C., Zhong, Z., Croft, M., Sviridov, L., Banerjee, S. and Steingart, D. A., Materials Research Society Fall Meeting, 2013
32. 'Correlating Light Microscopy and Electron Microscopy for Measuring Microstructural Evolution During Electrochemical Deposition', Keist, J., Orme, C., Ross, F., Steingart, D. A.,Wright, P. and Evans, J., Advances in Imaging and Electron Physics, 2013
31. 'Phase-field modeling of dendritic zinc deposition in Zinc-Nickel flow batteries', Ross, F. M., den Heijer, M., Williamson, M. J. and Steingart, D. A., Fall Electrochemical Society Meeting, 2011
30. 'In situ Liquid Cell Transmission Electron Microscopy of Dendrite Formation in Zinc-Based Batteries and Battery Interfaces', Desai, D., Lamorgese, A., Ito, Y., Patil, D., Banerjee, S. and Steingart, D. A., Fall Electrochemical Society Meeting, 2011
29. 'Cycle Life of Manganese Dioxide Electrodes for Grid-Scale Batteries', Narang, P., Steingart, D. A.,Gogotsi, Y. and Ross, F., Fall Electrochemical Society Meeting, 2011
28. 'Development of Secondary Rechargeable Batteries based Aluminum as Anode Material Electrodeposited from Ionic liquids', Gallaway, J. W., Ingale, N., Nyce, M., Ito, Y., Sviridov, L., Gaikwad, A., Lever, S., Firouzi, A., Banerjee, S. and Steingart, D. A., Fall Electrochemical Society Meeting, 2011
27. 'Rotating Disk Electrode Study of MnO2 Electrode', Ingale, N., Gallaway, J., Steingart, D. A.,Banerjee, S. and Couzis, A., Fall Electrochemical Society Meeting, 2011
26. 'Polyethylene Oxide Design for Lithium Transference Optimization, Fall Electrochemical Society Meeting', Gaikwad, A., Gallaway, J. W. and Steingart, D. A., Polyethylene Oxide Design for Lithium Transference Optimization, Fall Electrochemical Society Meeting, 2011

25. 'Zinc Morphology in Zinc Nickel-Oxide Batteries', ONeill, S., Tu, R. and Steingart, D. A., Fall Electrochemical Society Meeting, 2011
24. 'Further studies in the electrochemical/mechanical strength of printed microbatteries', Ito, Y., Desai, D., Wei, X., Steingart, D. A. and Banerjee, S., Society for Optics and Photonics Defense, Security, and Sensing Meeting, 2011
23. 'In-Situ Study of Additives on Zinc Deposition Morphology', Gaikwad, A.M. and Steingart, D. A., Fall Electrochemical Society Meeting, 2011
22. 'Aluminum as anode material electrodeposited from ionic liquids for secondary rechargeable batteries', Gaikwad, A., Anantharaman, B., Gallaway, J. W. and Steingart, D. A., Spring Electrochemical Society Meeting, 2011
21. 'Effect of Particle Size and Volume Fraction on Rheological Properties and Performance of a Semi-Solid Flow Battery', Ingale, N., Gallaway, J., Steingart, D. A., Khatun, S., Sideris, P., Greenbaum, S., Banerjee, S. and Couzis, A., Fall Electrochemical Society Meeting, 2011
20. 'Zinc Layer Current Distribution in Secondary Zinc Metal Batteries for Grid Scale Electrical Storage', Wang, M., Van Tassel, B., Lever, S., Lee, B., Joshi, A., Steingart, D. A. and Sun, Y., Fall Electrochemical Society Meeting, 2010
19. 'Electrochemical Characterization of Nanoparticle Silver Based Zn-AgO batteries', Gallaway, J. W., Ito, Y., Desai, D., Nyce, M., Banerjee, S. and Steingart, D. A., The Minerals, Metals and Materials Society Meeting, 2010
18. 'Wireless Instrumentation of Aluminum Smelting Operations', Gaikwad, A.M., Gallaway, J. and Steingart, D. A., The Minerals, Metals and Materials Society Meeting., 2010
17. 'Morphology of Zinc Studied Under Additive Control within Microfluidic Channels', Steingart, D. A., Evans, J.W. and Wright, P., The Minerals, Metals and Materials Society Meeting, 2010
16. 'Measurement of Mechanical Strength of Printed Silver Electrode Using A Microfluidic Device', Gallaway, J., Gaikwad, A.M. and Steingart, D. A., Electrochemical Society Meeting, 2010
15. 'Characterization of Novel Silver Nanopaste Inks as Electrochemically Active Materials using Microfluidic Electrochemistry', Gaikwad, A. M., Gallaway, J. W. and Steingart, D. A., Electrochemical Society Meeting, 2009
14. 'Micropower materials development for wireless sensor networks', Steingart, D. A., Gallaway, J. W. and Gaikwad, A., Materials Research Society Spring 2009, 2008
13. 'Integration of Lithium Ion Battery and Electrochemical Capacitor Energy Storage Directly On-Chip using Direct Write Dispenser Printing', Steingart, D. A., Roundy, S., Wright, P. K. and Evans, J. W., Electrochemical Society Meeting, 2008
12. 'Tailoring electrochemical capacitor energy storage using direct write dispenser printing', Ho, C. C., Steingart, D. A., Evans, J. and Wright, P., Electrochemical Society Meeting, 2008
11. 'Thick film thermoelectric energy harvesting systems for biomedical applications', Ho, C. C., Steingart, D. A., Evans, J.W. and Wright, P.W., in Medical Devices and Biosensors, 2008., 2008
10. 'PicoCube: a 1 cc sensor node powered by harvested energy', Koplow, M., Chen, A., Steingart, D. A.,Wright, P. K. and Evans, J. W., in The 45th annual Design Automation Conference, 2008
9. 'Energy harvesting-A systems perspective', Chee, Y.-H., Koplow, M., Mark, M., Pletcher, N., Seeman, M., Burghardt, F., Steingart, D. A.,Rabaey, J., Wright, P. and Sanders, S., in Electronic Devices Meeting, 2007., 2007
8. 'A Novel Method for Electrochemically Depositing Materials in Precise Locations without Bath Exposure', Rabaey, J., Burghardt, F., Steingart, D. A.,Seeman, M. and Wright, P., Electrochemical Society Meeting, 2007
7. 'Evaluation of Carbon Supercapacitors Fabricated Using Pneumatic Dispenser Direct Write Printing Tailored for Small, Autonomous Electronic Devices', Steingart, D. A., Ho, C., Evans, J. and Wright, P., Electrochemical Society Meeting Fall 2007, 2007
6. 'Dispenser Direct Write Printing of Thick Film Lithium Ion Polymer Microbatteries', Ho, C. C., Steingart, D. A., and Evans, J., Electrochemical Society Meeting Fall 2006, 2006
5. 'A Small, Low Cost Wireless Galvanostat based on Open Source Hardware and Software', Steingart, D. A., Ho, C., Salminen, J., Evans, J. and Wright, P., Electrochemical Society Meeting

Fall 2005, 2005

4. 'Modeling and Stencil/ScreenPrint Fabrication of Thick Film Lithium Polymer Ion MicroBatteries for Smart Dust Applications', Steingart, D. A., Redfern, A., Ho, C., Wright, P. and Evans, J., Electrochemical Society Meeting Fall 2005, 2005
3. 'An integrated node for energy-scavenging, sensing, and data-transmission', Steingart, D. A., Ho, C., Evans, J. and Wright, P., Workshop Wearable Implantable Body Sensor Networks , Imperial College London., 2005
2. 'Augmented cognition for fire emergency response: An iterative user study', Hammond, K., Lai, E., Leland, E., Mellers, S., Steingart, D. A., Carleton, E., Reilly, B., Baker, J., Otis, B., Rabaey, J., Wright, P.W., 1st International Conference on Augmented Cognition., 2005
1. 'Design of an on-chip secondary lithium ion polymer microbattery for millimeter-scale wireless nodes', Steingart, D. A., Wilson, J., Redfern, A., Wright, P., Romero, R. and Lim, L., The Minerals Metals and Materials Society Meeting, 2004

Service within Columbia University

- Activate - Columbia NY Exploration Committee 2021-2022
- Chair, Undergraduate Committee, EEE SEAS CU 2020-2021
- Chair, Space Committee, EEE SEAS CU 2019-2020
- Task Force to Showcase Engineering Majors to First-Year Students, Columbia University 2019
- Faculty Search Chair, Columbia University Department of EEE 2019

Service outside Columbia University

- Member-At-Large Battery Division 2021-2022 | Electrochemical Society
- Editor MRS Energy and Sustainability Special Issue 2021-2022 | Materials Research Society
- Panel Review Member National Synchrotron Light Source II 2017-2021 | Brookhaven National Laboratory
- Co-Organizer, Advanced Batteries, Materials Research Society Spring Conference, 2020 | Materials Research Society
- Gordon Research Conference Batteries Chair, 2020 | Gordon Research Conference
- Organizer, Andlinger Center for Energy and The Environment E-ffiliates Retreat, 2014 - 2018 | Princeton University
- Gordon Research Conference Batteries Vice Chair, 2018 | Gordon Research Conference
- Editor, Electrochemical Society Interface Special Issue, Spring 2016 | Electrochemical Society
- Track Organizer (100 Presentations), Electrochemical Society Fall 2015 | Electrochemical Society
- Topic Organizer, The American Society of Mechanical Engineers InterPACK 2015 | American Society of Mechanical Engineers
- Organizer, Andlinger Center for Energy and The Environment E-ffiliates Retreat, 2015 | Princeton University
- Organizing Committee, National Academy of Engineering Frontiers of Engineering, 2013-2014 | Princeton University
- Member, Graduate Committee, Mechanical and Aerospace Engineering 2013-2015 | Princeton University
- Upper Class Advisor, Mechanical and Aerospace Engineering 2013-2015 | Princeton University
- Member, Graduate Committee, MAE 2013 - 2018 | Princeton University
- Board Member, EYEBEAM Computational Fashion Program, 2013 | EYEBEAM
- Board Member, Zahn Center, CCNY, 2013 | City College of New York
- Organizer, Andlinger Center for Energy and The Environment Highlight Seminar Series, 2013 | City College of New York
- Founder, Zahn Center, City College of New York 2013 | City College of New York

- Founding Director, Kaylie Prize, City College of New York 2010 - 2012 | City College of New York
- Reviewer for Nature Materials, Nature Nanotechnology, Journal of the Electrochemical Society, Advanced Energy Materials, Advanced Materials, Advanced Energy Materials, Advanced Functional Materials, Institute of Electrical and Electronics Engineers Sensors |
- Panel Reviewer for National Science Foundation, Department of Energy and American Association for the Advancement of Science Proposals |

Funding

Funded Projects

23. 2021-2024 Department of Energy Advanced Research Projects Agency For Energy Awarded. # pending Lithium Ion Bobbin Cells for Grid Scale Energy Storage ($149,800) PI: Steingart; Awarded. # pending
22. 2021-2022 DOE-INL Awarded Spatial Analysis of Battery Modules ($59,900) PI: Steingart; Awarded *Small Subcontract*
21. 2021-2023 General Motors Awarded Lithium Structural Analysis via Acoustic Interrogation ($125,000) PI: Steingart; Awarded
20. 2021-2023 Department of Energy Advanced Research Projects Agency For Energy DE-AR0001406 Minimal Overhead Storage Technology ($2,450,692 to Columbia, 10% cost share from Columbia) PI: Steingart; Co-PI: West; DE-AR0001406
19. 2021-2022 Office of Naval Research In Contract Safety and Degradation Analysis of Energy Storage Systems for Marine Applications ($150,000) PI: Steingart; Co-PI: Fitts; In Contract
18. 2021-2024 Israeli Chemical In Contract Physical Chemistry of Phosphorus and Bromine Compounds ($750,000) PI: Steingart; Co-PI: Marbella; In Contract
17. 2021-2022 Mercedes Benz In Contract Understanding Fundamental Calorimetry of Lithium Metal Crossover ($124,850) PI: Steingart; In Contract
16. 2019-2021 Department of Energy Advanced Research Projects Agency For Energy DE-AR0000990 Minimal Overhead Storage Technology ($1,599,960 Total, $1,107,690 Columbia Award, 10% Cost Share from Columbia) PI: Steingart, La O'; Co-PI: West; DE-AR0000990
15. 2018-2020 Department of Energy Vehicle Technology Office Subcontract from Idaho National Lab to Princeton Unwanted Lithium Studies with Acoustics ($100,000) PI: Steingart; Subcontract from Idaho National Lab to Princeton
14. 2017-2020 Daimler Direct Award to Princeton Fundamental Studies in Lithium Deposition ($150,000) PI: Steingart; Direct Award to Princeton
13. 2017-2020 Alpha-En Direct Award to Princeton Lithium Metal Deposition From Aqueous Sources ($150,000) PI: Steingart; Direct Award to Princeton
12. 2016-2018 ExxonMobil / Andlinger Center Direct Award to Princeton Second Life Battery Analysis ($400,000) PI: Steingart; Direct Award to Princeton
11. 2016-2019 Israeli Chemical Direct Award to Princeton Zinc Bromine Battery Studies ($200,000) PI: Steingart; Direct Award to Princeton
10. 2015-2017 National Science Foundation CBET-1318163 EAGER: Collaborative Research: Shear Dependent Reaction Kinetics in Particulate Electrochemical Energy Storage ($48,000) PI: Steingart; CBET-1318163
9. 2015-2017 National Science Foundation PCAS-1406450 Collaborative Research: High-Density, Cost-Effective Electrochemical Power Management with Real-Time Diagnostics ($150,000) PI: Steingart; PCAS-1406450
8. 2015-2018 Department of Energy Advanced Research Projects Agency For Energy DE-AR0000621 Fast Electrochemical Acoustic Signal Interrogation for Battery Lifetime Enhancement ($486,825) PI: Steingart; DE-AR0000621 *Led to Feasible Corp, which is working with companies worldwide now, raised over $3M*

7. 2015-2019 BP Carbon Mitigation Initiative Direct Award to Princeton Fundamental Studies in Metal Deposition ($250,000) PI: Steingart; Direct Award to Princeton
6. 2014-2015 National Science Foundation CMMI-1402872 GOALI: A Comparative Study of Electrochemical Codeposition with In-Situ Electron Microscopy ($120,892) PI: Steingart; CMMI-1402872
5. 2013-2015 Department of Energy Advanced Research Projects Agency For Energy DE-AR0000400 Fast Aqueous Multiple Electron Ubiquitous Systems ($999,800 ; $736,475 to Princeton) PI: Steingart; Co-PI: Meng, Yushin; DE-AR0000400
4. 2012-2013 National Aeronautics and Space Administration Direct Award to Princeton Structural Batteries for Hybrid Electric Propulsion System ($100,000) PI: Steingart; Co-PI: Hertzberg; Direct Award to Princeton
3. 2010-2013 National Science Foundation CMMI-1031208 GOALI: A Comparative Study of Electrochemical Codeposition with In-Situ Electron Microscopy ($299,506) PI: Steingart; CMMI-1031208
2. 2010-2015 Department of Energy Advanced Research Projects Agency For Energy DE-AR 0000150 Long Life Zn-MnO2 Battery ($3,00,000 Award to CCNY + $1,000,000 Cost Share) PI: Banerjee,Steingart; Co-PI: O'Brien, Couzis; DE-AR 0000150 *Led to Urban Electric Power which is making batteries now, raised over $10M. Also led to Voltaiq, which has raised over $10M as well.*
1. 2010-2015 Department of Energy Advanced Research Projects Agency For Energy DE-AR0000114 Metacapacitors ($1,568,278 Award to CCNY + $300,000 K Cost Share) PI: O'Brien, Steingart; Co-PI: Kymissis, Kinget, Sanders; DE-AR0000114

Pending Projects

1. 2021-2025 National Science Foundation Pending CE-BEST (ERC led by U michigan) ($25,000,000 (Columbia $660,000)) PI: Stefanopoulou (UMich); Co-PI: Steingart; Pending

Mentorship

Graduate Students

18. Alex Bi, MS, Columbia University, 2021
    Thesis: *Adaptive Plating Systems*
    Current Position: Startup
17. Wesley Chang, PhD, Princeton University, 2021
    Thesis: *Hysteresis in Lithium Metall Energy Storage Systems*
    Current Position: Drexel
16. Robert Mohr, PhD, Columbia University, 2022
    Thesis: *Regenerative Metal-Halide Energy Storage*
    Current Position: Innate Energy
15. Mateo Williams, MS, Columbia University, 2020
    Thesis: *Multiphysics Analysis of Geometric Influence on Electrochemical Energy Storage*
    Current Position: nan
14. Thomas Hodson, PhD, Princeton University, 2020
    Thesis: *Transient Mechanical Behavior in Closed-Form Electrochemical Energy Storage Systems*
    Current Position: nan
13. Abhishek Raj, PhD, Princeton University, 2020
    Thesis: *Modes of Failure in Energy Storage Systems*
    Current Position: Apple
12. Yihan Zhang, MS, Columbia University, 2020
    Thesis: *ZnBr2 Species Characterization*

Current Position: Engineer, Panasonic

11. Shripad Patil, MS, Columbia University, 2020
    Thesis: *Cell Analysis of ZnBr2 systems*
    Current Position: PhD Student, UT Knoxville
10. Andrew Kim, PhD, Princeton University, 2019
    Thesis: *Thermal Influences On Electrochemical Energy Storage*
    Current Position: Senior Research Engineer, Boeing
9. Koshu Takatsuji, MS, Princeton University, 2019
    Thesis: *Minimal Overhead Storage Technologies*
    Current Position: Research Analyst, Lux
8. Greg Davies, PhD, Princeton University, 2018
    Thesis: *Ultrasound Analysis of Electrochemical Cells*
    Current Position: Post Doc, Princeton University
7. Tanya Gupta, PhD, Princeton University, 2017
    Thesis: *Surface Phenomenon in Electrochemical Systems*
    Current Position: Senior Engineer, E-Ink
6. Shoham Bhadra, PhD, Princeton University, 2015
    Thesis: *Methods for Characterization of Batteries Using Acoustic Interrogation*
    Current Position: Managing Engineering, Exponent
5. Barry Van Tassell, PhD, The City College of The City University of New York, 2015
    Thesis: *Scalable Fabrication of Thin Film Ceramic Capacitors using Spray Deposition*
    Current Position: CIO, Feasible Inc
4. Abhinav Gaikwad, PhD, The City College of The City University of New York, 2012
    Thesis: *Printed, Compliant Electrochemical Systems*
    Current Position: R&D Manager, Moses Lake Industries
3. Paul Chando, MS, The City College of The City University of New York, 2012
    Thesis: *Metacapacitors*
    Current Position: Graduate Student, Syracuse University
2. Tongwei Xu, MS, Columbia University, 2022
    Thesis: *nan*
    Current Position: PhD Columbia West
1. Dingyi Zhao, MS, Columbia University, 2022
    Thesis: *nan*
    Current Position: RA Steingart

Undergraduate Students

14. Aoi Senju, Princeton University, 2016
    Project: *Lossy Cathode Carbons for Static ZnBr2 Batteries*
13. Michael Wang, Princeton University, 2016
    Project: *Decoupling Electrode Behavior in Electrochemical Acoustic Time of Flight Analysis*
12. Lucas Amber, Princeton University, 2015
    Project: *Design of an Electric Powertrain for a Formula Hybrid Racecar*
11. Caleb Bradford, Princeton University, 2015
    Project: *Printed Electronics and Batteries*
10. Daniel Davies, Princeton University, 2015
    Project: *The Adustat 3.0*
9. Matthew Floyd, Princeton University, 2015
    Project: *Printed Electronics and Batteries*
8. Peter Gjeltema, Princeton University, 2015
    Project: *Ultrasonic Interrogation of Batteries*
7. Aashna Mehra, Princeton University, 2015

Project: *Hydrated Manganese Doped Calcite As An Oxygen-Reduction Reaction Catalyst*

6. Robert Mohr, Princeton University, 2015
   Project: *Static Zinc Bromine System Design*
5. Gideon Grossman, Princeton University, 2014
   Project: *Design of a Low-Cost Frequency Response Analyzer for Electrochemical Impedance Spectroscopy*
4. Howie Chu, The City College of the City University Of New York, 2012
   Project: *Flexible Batteries*
3. Jamesly Rousseau, The City College of the City University Of New York, 2012
   Project: *Printed Electronics and Batteries*
2. Alla Zamarayeva, The City College of the City University Of New York, 2012
   Project: *Flexible Batteries*
1. Philip Liu, The City College of the City University Of New York, 2011
   Project: *Electrochemical Microfluidics*

Postdoctoral Researchers

13. Rebecca Ciez, Princeton University, 2018 to 2020
    Topic: *Battery Economics*
    Current Position: Assistant Professor, Purdue ME
12. Clement Bommier, Princeton University, 2017 to 2019
    Topic: *Lithium Ion Failure*
    Current Position: Senior Engineer, Boeing
11. Jeung Hun Park, Princeton University, 2016 to 2018
    Topic: *Materials Characterization*
    Current Position: Research Scientist, Princeton
10. Kevin Knehr, Princeton University, 2016 to 2018
    Topic: *Transport Modeling*
    Current Position: Senior Engineer, Honeywell
9. Shaurjo Biswas, Princeton University, 2015 to 2017
   Topic: *Zn Br2 Batteries*
   Current Position: CTO, Feasible Inc
8. Andrew Hsieh, Princeton University, 2014 to 2016
   Topic: *Electrochemical Acoustic Behavior*
   Current Position: CEO, Feasible Inc
7. Benjamin Hertzberg, Princeton University, 2012 to 2014
   Topic: *MnO2 Electrodes*
   Current Position: Senior Engineer, Enersys
6. Satyajit Phadke, Princeton University, 2013 to 2014
   Topic: *Zn MnO2 Batteries*
   Current Position: Manager, CES
5. Joshua Gallaway, The City College of The City University of New York, 2009 to 2013
   Topic: *Zn MnO2 Batteries*
   Current Position: Assistant Professor, Northeastern ChE
4. Eli Leland, The City College of The City University of New York, 2011 to 2013
   Topic: *Metacapacitors*
   Current Position: CTO, Voltaiq Inc
3. Tal Sholklapper, The City College of The City University of New York, 2011 to 2013
   Topic: *Zn MnO2 Batteries*
   Current Position: CEO, Voltaiq Inc
2. Richard May, Columbia, 2022 to Current
   Topic: *Recycling*

Current Position: nan

1. Andrew Wang, Columbia, 2022 to Current
   Topic: *Bobbin*
   Current Position: nan

Courses Taught

37. Spring 2023, EAEE 2002/4002 Alternative Energy Resources, Columbia University; Enrollment: 110
36. Fall 2022, EAEE 6181 Advanced Electrochemical Energy Storage, Columbia University; Enrollment: 19, Class Rating 4.67/5.0, Faculty Rating 4.67/5.0
35. Spring 2021, EAEE 3905 Techno Economic Analysis of Energy Systems Research, Columbia University; Enrollment: 8
34. Spring 2021, EAEE 2002/4002 Alternative Energy Resources, Columbia University; Enrollment: 86, Class Rating 4.5/5.0, Faculty Rating 4.6/5.0
33. Fall 2020, EAEE 6181 Advanced Electrochemical Energy Storage, Columbia University; Enrollment: 10, Class Rating 4.89/5.0, Faculty Rating 5.0/5.0
32. Spring 2020, EAEE 2002/4002 Alternative Energy Resources, Columbia University; Enrollment: 42, Class Rating 4.13/5.0, Faculty Rating 4.13/5.0
31. Spring 2020, EAEE 4180 Energy Storage Systems, Columbia University; Enrollment: 10, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
30. Fall 2019, EAEE 3095 Advanced Electrochemical Energy Storage, Columbia University; Enrollment: 6
29. Fall 2019, EAEE 3095 Build Your Own Adventure, Columbia University; Enrollment: 6
28. Spring 2019, EAEE 2002/4002 Alternative Energy Resources, Columbia University; Enrollment: 10, Class Rating 4.4/5.0, Faculty Rating 4.4/5.0
27. Spring 2019, EAEE 4180 Energy Storage Systems, Columbia University; Enrollment: 10, Class Rating 4.25/5.0, Faculty Rating 4.0/5.0
26. Fall 2018, MSE 501 Materials Science, Princeton University; Enrollment: 10, Class Rating 4.0/5.0, Faculty Rating 4.0/5.0
25. Spring 2018, MAE 424 Energy Storage Systems, Princeton University; Enrollment: 12, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
24. Fall 2017, MSE 501 Materials Science, Princeton University; Enrollment: 9, Class Rating 4.0/5.0, Faculty Rating 4.0/5.0
23. Spring 2017, MAE 224 MAE Lab, Princeton University; Enrollment: 45, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
22. Spring 2017, MAE 424 Energy Storage Systems, Princeton University; Enrollment: 15, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
21. Fall 2016, MAE 221 Thermodynamics, Princeton University; Enrollment: 45, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
20. Fall 2016, MAE 224 MAE Lab, Princeton University; Enrollment: 45, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
19. Spring 2016, MAE 224 MAE Lab, Princeton University; Enrollment: 42, Class Rating 3.0/5.0, Faculty Rating 3.0/5.0
18. Spring 2016, MAE 424 Energy Storage Systems, Princeton University; Enrollment: 12, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
17. Fall 2015, MAE 221 Thermodynamics, Princeton University; Enrollment: 46, Class Rating 3.0/5.0, Faculty Rating 3.0/5.0
16. Fall 2015, MAE 224 MAE Lab, Princeton University; Enrollment: 46, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
15. Spring 2015, MAE 224 MAE Lab, Princeton University; Enrollment: 46, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0

14. Spring 2015, MAE 424 Energy Storage Systems, Princeton University; Enrollment: 9, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
13. Fall 2014, MAE 221 Thermodynamics, Princeton University; Enrollment: 49, Class Rating 3.0/5.0, Faculty Rating 3.0/5.0
12. Fall 2014, MAE 224 MAE Lab, Princeton University; Enrollment: 49, Class Rating 3.0/5.0, Faculty Rating 3.0/5.0
11. Spring 2014, MAE 424 Energy Storage Systems, Princeton University; Enrollment: 8, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
10. Spring 2014, MAE 424 MAE Lab, Princeton University; Enrollment: 48, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
9. Fall 2013, MAE 224 MAE Lab, Princeton University; Enrollment: 48, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
8. Spring 2013, MAE 424 Energy Storage Systems, Princeton University; Enrollment: 8, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
7. Fall 2012, CHE 330 Energy Storage Systems, The City College of the City University of New York; Enrollment: 12, Class Rating 4.0/5.0, Faculty Rating 4.0/5.0
6. Spring 2012, CHE 228 Thermodynamics I, The City College of the City University of New York; Enrollment: 60, Class Rating 3.5/5.0, Faculty Rating 3.5/5.0
5. Fall 2011, CHE 229 Thermodynamics II, The City College of the City University of New York; Enrollment: 35, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
4. Spring 2011, CHE 320 Advanced Thermodynamics, The City College of the City University of New York; Enrollment: 10, Class Rating 4.0/5.0, Faculty Rating 4.0/5.0
3. Fall 2010, CHE 325 Advanced Materials, The City College of the City University of New York; Enrollment: 13, Class Rating 4.0/5.0, Faculty Rating 4.0/5.0
2. Spring 2010, CHE 320 Advanced Thermodynamics, The City College of the City University of New York; Enrollment: 12, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0
1. Fall 2009, CHE 330 Energy Storage Systems, The City College of the City University of New York; Enrollment: 15, Class Rating 4.5/5.0, Faculty Rating 4.5/5.0