

## Yuan Yang

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### Education

Sep 2007 – Jun 2012      Ph.D., Department of Materials Science and Engineering,  
Stanford University  
Sep 2003 – Jul 2007      B.S., Department of Physics, Peking University, China

### Professional Experience

Jan 2020 – present      Associate Professor, Materials Science and Engineering,  
Department of Applied Physics and Applied Mathematics,  
Columbia University  
Jul 2015 – Dec 2019      Assistant Professor, Materials Science and Engineering,  
Department of Applied Physics and Applied Mathematics,  
Columbia University  
Jul 2012 – Jun 2015      Postdoctoral Associate, Department of Mechanical Engineering,  
MIT

### Awards & Honors

2020-2022      Clarivate Highly Cited Researcher  
Jan 2022      *Materials Today* Rising Star Award  
Dec 2021      *Energy Storage Materials* Young Scientist Award  
Mar 2021      3M Non-tenured Faculty Award  
Jun 2020      IAAM Innovation Award of the International Association of Advanced  
Materials (IAAM)  
Oct 2019      Emerging Investigators Award by *Journal of Materials Chemistry A*.  
Jun 2019      *Nano Research* Young Innovator Awards in NanoEnergy 2019  
Aug 2017      Scialog Fellow on Advanced Energy Storage  
Apr 2015      MRS Postdoctoral Award for 2015 Spring Meeting  
Dec 2014      World Changing Ideas Selected by *Scientific American*

### Journal Publications

\*: corresponding author    §: equal contribution

Total citation > 30,000 times    H index: 64

105. Q. Cheng, G. W. Ho\*, A. P. Raman\*, R. Yang\*, Y. Yang\*, Regulating thermal radiation

- for energy and sustainability. *Next Energy*, 1, 100019 (2023).
104. J. Wild, H. Chen, K. Liang, J. Liu, S. Cox, A. Halliday, Y. Yang\*, Liquid solution centrifugation for safe, scalable, and efficient isotope separation. *Science Advances*, 9, 8993 (2023).
  103. T. Jin, G. Singer, K. Liang, Y. Yang, Structural batteries: Advances, challenges and perspectives. *Materials Today*, 62, 151 (2023).
  102. Y. Chen, B. Zhao, Y. Yang, A. Cao\*, Toward High-Areal-Capacity Electrodes for Lithium and Sodium Ion Batteries. *Advanced Energy Materials*, 2201834 (2022).
  101. Q. Cheng\*, T. Jin, Y. Miao, Z. Liu, J. Borovilas, H. Zhang, S. Liu, H. Wang, X. Chen, L-Q. Chen, W. Min\*, Y. Yang\*, Stabilizing Lithium Metal Anode by Ion Depletion-Induced Phase Transformation in Polymer Electrolytes. *Joule*, 6, 1-18 (2022).
  100. Z. Jin\*, Q. Cheng, S.T. Bao, R. Zhang, A. M. Evans, F. Ng, Y. Xu, M. L. Steigerwald, A. E. McDermott, Y. Yang\*, C. Nuckolls\*. Iterative Synthesis of Contorted Macromolecular Ladders for Fast-Charging and Long-Life Lithium Batteries. *Journal of the American Chemical Society* 144, 13973 (2022).
  99. Z. Jin\*, Q. Cheng, A.M. Evans, J. Gray, R. Zhang, S.T. Bao, F. Wei, L. Venkataraman, Y. Yang\*, C. Nuckolls\*;  $\pi$ -Conjugated redox-active two-dimensional polymers as organic cathode materials. *Chemical Science*, 13, 3533 (2022).
  98. J. Wild, P. Wang, T. Jin, Y. Yang\*; Modeling Isotope Separation in Electrochemical Lithium Deposition. *Journal of The Electrochemical Society*, 169, 032504 (2022).
  97. T. Xu, C. Chen, T. Jin, S. Lou, R. Zhang, X. Xiao, X. Huang\*, Y. Yang\*; Chemical Heterogeneity in PAN/LLZTO Composite Electrolytes by Synchrotron Imaging. *Journal of the Electrochemical Society*, 168, 110522 (2021).
  96. M. Chen\*, S. Li, D. Pang, Y. Zhao, Y. Yang, H. Yan\*; Numerically enhancing daytime radiative cooling performance of random dielectric microsphere coatings by hollow structures. *Journal of Photonics for Energy*, 11, 042108 (2021).
  95. M. Chen, D. Pang, X. Chen, H. Yan\*, Y. Yang, Passive daytime radiative cooling: Fundamentals, material designs, and applications. *EcoMat*, 4, e12153 (2022).
  94. Y. Ma, T. Jin, R. Choudhury, Q. Cheng, Y. Miao, C. Zheng, W. Min, Y. Yang\*; Understanding the Correlation between Li Dendrite Growth and Local Material Properties by Machine Learning. *Journal of the Electrochemical Society*, 168, 090523 (2021).
  93. T. Jin, Y. Ma, Z. Xiong, X. Fan, Y. Luo, Z. Hui, X. Chen, Y. Yang\*; Bio-inspired, Tree-Root-like Interfacial Designs for Structural Batteries with Enhanced Mechanical Properties. *Advanced Energy Materials*, 11, 2100997 (2021).
  92. Z. Hui, K. Mayilvahanan, K. Ganko, Y. Yang, X. Zhang, Z. Ju, K.J. Takeuchi, A. Marschilok, G. Yu, E. Takeuchi, A.C. West, Optimal electrode-scale design of Li-ion electrodes: A general correlation. *Energy Storage Materials*, 39, 176 (2021).
  91. X. Liao, X. Lan, N. Ni, P. Yang, Y. Yang\*, X. Chen\*, Bismuth Oxychloride Nanowires for Photocatalytic Decomposition of Organic Dyes, *ACS Applied Nano Materials*, 4, 3887 (2021).
  90. R. Choudhury, J. Wild, Y. Yang\*; Engineering Current Collectors for Batteries with High Specific Energy. *Joule*, 5, 1301 (2021).
  89. J. C. Russell, V. A. Posey, J. Gray, R. May, D. A. Reed, H. Zhang, L. E. Marbella, M.

- L. Steigerwald, **Y. Yang**, X. Roy\*, C. Nuckolfs\*, S. Peurifoy\*, High Performance Organic Pseudocapacitors via Molecular Contortion, *Nature Materials*, 20, 1136 (2021).
88. W. Huang, Y. Chen, Y. Luo, J. Mandal, W. Li, M. Chen\*, C. Tsai, T. Jin, Y. Zhang, P. Wang, Z. Shan, N. Yu, **Y. Yang\***, Scalable Aqueous Processing-based Radiative Cooling Coatings, *Advanced Functional Materials*, 2010334 (2021).
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86. M. Chen, D. Pang, J. Mandal, X. Chen, H. Yan, Y. He, N. Yu, **Y. Yang\***, Designing Mesoporous Photonic Structures for High-Performance Passive Daytime Radiative Cooling. *Nano Letters*, 21, 1412 (2021).
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84. Z. Li, H. Zhang, X. Sun\*, **Y. Yang\***, Mitigating Interfacial Instability in Polymer Electrolyte-based Solid-State Lithium Metal Batteries with 4V Cathodes. *ACS Energy Letters*, 3244 (2020).
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82. C. Lu, Y. Chen, **Y. Yang**, X. Chen\*, Single-atom Catalytic Materials for Lean-electrolyte Ultrastable Lithium–Sulfur Batteries. *Nano Letters*, 20, 5522 (2020).
81. Z. Hui, K. Mayilvahanan, **Y. Yang**, A. West\*, Determining the Length Scale of Transport Impedances in Li-Ion Electrodes:  $\text{Li}(\text{Ni}_{0.33}\text{Mn}_{0.33}\text{Co}_{0.33})\text{O}_2$ . *Journal of The Electrochemical Society*, 167, 100542(2020).
80. **Y. Yang\***, Y. Zhang, Passive daytime radiative cooling: Principle, application, and economic analysis. *MRS Energy & Sustainability*, 7, E18 (2020).
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78. Q. Lin, Y. Zhang, A. Mieghem, Y. Chen, N. Yu, N, **Y. Yang**, H. Yin\*, Design and experiment of a sun-powered smart building envelope with automatic control. *Energy and Buildings*, 223, 110173 (2020).
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76. Z. Li, A. Li, H. Zhang, F. Ning, W. Li, A. Zangiabadi, Q. Cheng, J. Borovilas, Y. Chen, H. Zhang, X. Xiao, C. Ouyang, X. Huang, Chuying, O.; X. Huang, W. K. Lee, M. Ge, Y. S. Chu, X. Chuan, **Y. Yang\***, Multi-scale stabilization of high-voltage  $\text{LiCoO}_2$  enabled by nanoscale solid electrolyte coating. *Energy Storage Materials*, 29, 71 (2020).
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  73. B. Xu, Z. Liu, J. Li, X. Huang, B. Qie, T. Gong, L. Tan, X. Yang, D. Parley, M. Dontigny, K. Zaghib, X. Liao, Q. Cheng, H. Zhai, X. Chen, L. Q. Chen\*, C. W. Nan\*, Y. H. Lin\*, **Y. Yang\***, Engineering Interfacial Adhesion for High-performance Lithium Metal Anode. *Nano Energy*, 67, 104242 (2020).
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  69. J. Mandal, M. Jia, A. Overvig, Y. Fu, E. Che, N. Yu, **Y. Yang\***, Porous Polymers with Switchable Optical Transmittance for Optical and Thermal Regulation. *Joule*, 3, 3088 (2019).
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  66. H. T. Maia, D. Li, **Y. Yang**, C. Zheng, LayerCode: optical barcodes for 3D printed shapes. *ACM Trans. Graph*, 38, 1 (2019).
  65. Q. Song, A. Li, L. Shi, Q. Cheng, T. G. Feric, Y. Fu, H. Zhang, Z. Li, P. Wang, Z. Li, H. Zhai, X. Wang, M. Dontigny, K. Zaghib, A.-H. Park, K. Myers, X. Chuan, **Y. Yang\***, Thermally stable, nano-porous and eco-friendly sodium alginate/attapulgit separator for lithium-ion batteries. *Energy Storage Materials*. 22, 48 (2019).
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  62. Q. Cheng, A. Li, N. Li, S. Li, Z. Amirali, Z. T. Li, W. Huang, A. Li, T. Jin, Q. Song, W. Xu, N. Ni, H. Zhai, D. Martin, Z. Karim Z, C. Xiu, D. Su, K. Yan\*, **Y. Yang\***, Stabilizing Solid Electrolyte-Anode Interface in Li-Metal Batteries by Boron Nitride-Based Nanocomposite Coating. *Joule*, 3, 1510 (2019).

61. T. Jin, Y. Wang, Z. Hui, B. Qie, A. Li, D. Paley, B. Xu, X. Wang, A. Chitu, H. Zhai, T. Gong, **Yuan Yang\***, Nonflammable, Low-Cost, and Fluorine-Free Solvent for Liquid Electrolyte of Rechargeable Lithium Metal Batteries *ACS Appl. Mater. Interfaces*, 11, 17333-17340 (2019)
60. X. Wang, H. Zhai, B. Qie, Q. Cheng, A. Li, J. Borovilas, B. Xu, C. Shi, T. Jin, X. Liao, Y. Li, X. He, S. Du, Y. Fu, Y. M. Dontigny, K. Zaghib, **Y. Yang\***, Rechargeable solid-state lithium metal batteries with vertically aligned ceramic nanoparticle/ polymer composite electrolyte. *Nano Energy*, 60, 205 (2019).
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57. G. Qian, X. Liao, Y. Zhu, F. Pan\*, X. Chen\*, **Y. Yang\***, Designing Flexible Lithium-Ion Batteries by Structural Engineering. *ACS Energy Letters* 4, 3 (2019).
56. B. Xu, H. Zhai, X. Liao, B. Qie, J. Mandal, T. Gong, L. Tan, X. Yang, K. Sun, Q. Cheng, M. Chen, Y. Miao, M. Wei, B. Zhu, Y. Fu, A. Li, X. Chen, W. Min, C. Nan\*, C, Y. Lin\*, **Y. Yang\***, Porous Insulating Matrix for Lithium Metal Anode with Long Cycling Stability and High Power, *Energy Storage Materials* 17, 31 (2019).
55. C. Shi, T. Wang, X. Liao, B. Qie, P. Yang, M. Chen, X. Wang, A. Srinivasan, Q. Cheng, A. Li, X. Chen, **Y. Yang\***, Accordion-like Stretchable Li-ion Batteries with High Energy Density, *Energy Storage Materials* 17, 136 (2019).
54. X. Liao, C. Shi, T. Wang, B. Qie, Y. Chen, P. Yang, Q. Cheng, H. Zhai, M. Chen, X. Wang, X. Chen\*, **Y. Yang\***, High-Energy-Density Foldable Battery Enabled by Zigzag-like Design, *Advanced Energy Materials*, 1802998 (2018).
53. J. Mandal, Y. Fu, A. Overvig, M. Jia, K. Sun, N. Shi, H. Zhou, X. Xiao, N. Yu\*, **Y. Yang\***, Hierarchically Porous Polymer Coatings for Highly Efficient Passive Daytime Radiative Cooling. *Science*, 362, 315 (2018).
52. Q. Cheng, L. Wei, Z. Liu, N. Ni, Z. Sang, B. Zhu, W. Xu, M. Chen, Y. Miao, L. Chen, W. Min, **Y. Yang\***, Operando and Three-Dimensional Visualization of Anion Depletion and Lithium Growth by Stimulated Raman Scattering Microscopy. *Nature Communications*, 9, 2942 (2018).
51. S. R. Peurifoy, J. C. Russell, T. J. Sisto, **Y. Yang\***, X. Roy\*, and C. Nuckolls\*, Designing Three-Dimensional Architectures for High-Performance Electron Accepting Pseudocapacitors. *Journal of the American Chemical Society*, 140(35), 10960 (2018).
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49. J. Mandal, S. Du, M. Dontigny, K. Zaghib, N. Yu\*, **Y. Yang\***,  $\text{Li}_4\text{Ti}_5\text{O}_{12}$ : A Visible-to-Infrared Broadband Electrochromic Material for Optical and Thermal Management. *Advanced Functional Materials*, 1802180 (2018).

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42. H. Zhai, P. Xu, M. Ning, Q. Cheng, J. Mandal, and **Y. Yang\***, A Flexible Solid Composite Electrolyte with Vertically Aligned and Connected Ion-Conducting Nanoparticles for Lithium Batteries. *Nano Letters*, 17 (5), 3182–3187 (2017).
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#### Book Chapters

1. Applications of Emerging Stimulated Raman scattering (SRS) Microscopy in Materials Sciences. in *Stimulated Raman Scattering Microscopy: Techniques and Applications* (2022)

#### Professional Activities

##### **Conference Organizer:**

5. Symposium A05-Extreme Batteries, 242nd ECS Meeting, Oct 9-13, 2022, Atlanta, GA, USA.
4. Symposium EN10: Advanced Materials for Thermal Energy Management and Harvesting, 2021 MRS Fall Meeting, Boston, MA, USA.
3. Symposium ST05: Mechanics of Energy Storage Materials, 2021 MRS Spring Meeting, Apr 17-23, 2021.
2. Symposium ES2: High Capacity Electrode Materials for Next-generation Energy Storage, 2017 MRS Spring Meeting, Phoenix, AZ, USA
1. Symposium B-5: Heat Transfer: from Meso-scale to Macro-scale, Oct 3-4, 2016, College Park, MD, USA

**Journal Reviewer:** Science, Nature Nanotechnology, Nature Energy, Chemical Reviews, Nature Reviews Materials, Joule, Matter, Nature Communications, Advanced Materials, Nano Letters, Energy & Environmental Science, Chemical Communications, Journal of Materials Chemistry, Nano research, Nano energy, Langmuir, RSC Advance, Physical Chemistry Chemical Physics, RSC Advances

**Memberships:** Materials Research Society, American Chemical Society. Electrochemical Society