

Science Discussion Series: Batteries seem to power everything today- cell phones, cars, homes, even airplanes! We are a team of scientists and engineers working on batteries and energy storage, let's discuss!

ScienceModerator¹ and r/Science AMAs¹

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Abstract

Hello Reddit! We are a group of scientists and engineers in academia and industry working on batteries and energy storage. Batteries are ubiquitous in our daily lives and we all have complained about them when using our favorite portable electronic devices. They are also critical in enabling the next generation of electric vehicles, such as electric cars and electric airplanes, and large-scale stationary energy storage. Let's discuss anything regarding batteries and other energy storage technologies! Our guests today are: Kristin Persson (u/KPatBerkeley): I am an Associate Professor in Materials Science and Engineering at UC Berkeley, and I direct the Materials Project which is a multi-institution, multi-national effort to compute the properties of all inorganic materials and provide the data and associated analysis algorithms to the world. The Persson group uses their expertise in materials informatics and the high-throughput infrastructure of the Materials Project to design novel photocatalysts, multi-valent battery electrode materials, Li-ion battery electrode materials and electrolytes for beyond-Li energy storage solutions. Twitter: @KPatBerkeley Shirley Meng (u/ShirleyMeng): I received my Ph.D. in Advance Materials for Micro & Nano Systems from the Singapore-MIT Alliance in 2005, after which I worked as a postdoc research fellow and became a research scientist at MIT. I currently hold the Zable Chair Professor in Energy Technologies and professor in NanoEngineering at University of California San Diego (UCSD), and am the principal investigator of the Laboratory for Energy Storage and Conversion (LESC) research group. The LESC research focuses on the direct integration of experimental techniques with first principles computation modeling for developing new materials and architectures for electrochemical energy storage. I am the founding Director of Sustainable Power and Energy Center (SPEC), consisting faculty members from interdisciplinary fields, who all focus on making breakthroughs in distributed energy generation, storage and the accompanying integration-management systems. I have received several prestigious awards, including International Battery Association Research Award (2019), Blavatnik National Awards Finalist (2018), American Chemical Society ACS Applied Materials & Interfaces Young Investigator Award (2018), International Coalition for Energy Storage and Innovation (ICESI) Inaugural Young Career Award (2018), IUMRS-Singapore Young Scientist Research Award (2017), C.W. Tobias Young Investigator Award of the Electrochemical Society (2016), BASF Volkswagen Electrochemistry Science Award (2015) and NSF CAREER Award (2011). I've published more than 170 peer-reviewed journal articles, two book chapters and eight patents, and am the elected Fellow of the Electrochemical Society. Ray Smith (u/thatkindofcell): I did a PhD in battery modeling at MIT focusing on active materials that exhibit phase changes during the charging and discharging process. Now, I do battery modeling research and development work at a San Francisco Bay Area company with particular focus on cell design, charging, and degradation processes. Matt Lacey (u/MattLacey): I graduated from the University of Southampton, United Kingdom, with a Master of Chemistry degree in 2008 and completed my PhD at the same university in 2012 under the supervision of Prof John R. Owen. I joined the Ångström Advanced Battery Centre in 2012 as a postdoc working on lithium-sulfur batteries, and in 2016 became a researcher in the same group. Since 2018 I am also a thematic researcher with the Swedish Electromobility Centre. My research interests centre on the electrochemistry of lithium batteries, particularly on ageing mechanisms. Twitter: @mjlacey Venkat Viswanathan (u/venkvis): I am faculty at

Carnegie Mellon University, working on batteries for electrifying cars, trucks and planes. Find out more – Twitter: @venkvis; website: <http://andrew.cmu.edu/~venkatv> Dan Steingart (u/steingart): I am the Stanley Thompson Associate Professor of Chemical Metallurgy in the Departments of Earth and Environmental Engineering and Chemical Engineering at Columbia University, and the co-director of the Columbia Electrochemical Energy Center. My group studies the systematic behavior of electrochemical cells. You may be familiar with my study on the (on-linear) bouncing behavior of AA cells. Twitter: @steingart; websites: <https://dansteingart.com/>, <https://ceec.engineering.columbia.edu/> Thank you so much for joining us! We will be around throughout the day, though mostly in the afternoon EST, to discuss energy storage with you!

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Dan Steingart ([u/steingart](https://www.reddit.com/user/dsteingart)): I am the Stanley Thompson Associate Professor of Chemical Metallurgy in the Departments of Earth and Environmental Engineering and Chemical Engineering at Columbia University, and the co-director of the Columbia Electrochemical Energy Center. My group studies the systematic behavior of electrochemical cells. You may be familiar with my study on the (on-linear) bouncing behavior of AA cells. Twitter: [@steingart](https://twitter.com/dsteingart); websites: <https://dansteingart.com/>, <https://ceec.engineering.columbia.edu/>

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