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DISTINGUISHED LECTURE SERIES



Now Available to Watch: Li Batteries: 50 Years Old and the Future Challenges for an American-Based Industry

Dr. M. Stanley Whittingham, FRS, Distinguished Professor of Chemistry and Materials Science and Engineering, Binghamton University



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From the Sept. 17, 2025, lecture

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“Nobel Laureate M. Stanley Whittingham on the Future of Energy Storage”

“We’ve talked enough. Now we have to do things — make things happen.”

ABSTRACT

The Nobel Committee citation read: “They have laid the foundation of a wireless, fossil fuel-free society, and are of the greatest benefit to humankind.” Now the world needs to take action. Although lithium batteries celebrated their 50th anniversary in 2022, they still achieve only 25% of their theoretical energy density. Even at that level, they now dominate portable energy storage. The dominant anode and cathode today are graphitic carbon and the layered NMC oxides, $\text{Li}[\text{NiMnCoAl}]\text{O}_2$. Both need improving; we must push the chemistry to its limits.

Ten-year lifetimes demand 99.95% reaction selectivity. Alternatives to Li-NMC cells will also be discussed, including the phosphates, in addition to a discussion of what is technically and/or politically challenging and may not be viable in an attempt to correct some of the exponential hype in the battery energy storage arena. A key challenge in the Western world is to build a sustainable supply chain and manufacturing capability that leapfrogs the present 30-year-old technology. We need to stop building new “old gigafactories” in North America.

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1 Castle Point Terrace None | Hoboken, NJ 07030 US

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