

# Dr. Jeff Dahn



Dr. Jeff Dahn stands as an innovative leader in the fields of lithium-ion and sodium-ion batteries, used worldwide. His journey began in 1978, encompassing both industry and academia, and he has focused on solving the intricate puzzles of advanced battery science. Throughout his career, Jeff has penned over 790 refereed journal publications and secured 78 distinct patents.

During his time at Moli Energy, Jeff led a team that uncovered the efficacy of ethylene carbonate as a solvent in lithium-ion batteries with graphite negative electrodes. This discovery continues to impact the industry, with ethylene carbonate serving as the standard solvent in virtually every lithium-ion battery.

In 2000, David Stevens and Jeff Dahn unveiled the utilization of "hard carbons" as negative electrode materials, contributing to the reduced global reliance on lithium for electrification, as sodium-ion batteries gain widespread recognition and commercial viability. The following year, Jeff Dahn and Zhonghua Lu unveiled the epochal "NMC" positive electrode materials, composed of layered lithium transition metal oxides with nickel, manganese, and cobalt. These NMC materials now power roughly 50% of all lithium-ion batteries, with an annual production exceeding one million tons.

Recognizing the crucial role of long-lasting batteries in the electric vehicle and grid storage domains, Jeff led a team in 2008 that engineered High Precision Coulometry. This innovative method detects minuscule degradation during each charge-discharge cycle of lithium-ion batteries and has led to the development of lithium-ion batteries with projected lifetimes exceeding 1 million miles, known to the media as the "million-mile battery."

In 2016, Jeff began a research partnership with Tesla to improve the energy density, lifetime, and cost of lithium-ion batteries. His group at Dalhousie has extended this partnership and currently stands as the sole university entity in the world associated with this company.

As a professor at Dalhousie University, Jeff has mentored over 65 PhD students and 30 post-doctoral researchers. His mentorship has earned him a Faculty of Science Teaching Award from both Simon Fraser University and Dalhousie University as well as the Canadian Association of Physicist's Medal for Excellence in Teaching.

Jeff Dahn's contributions to battery science and commitment to teaching have expanded the field, paving the way for future innovation in energy storage and inspired a new generation of scientists and engineers.