

What do we focus on in electrochemical energy storage?

We focus our research on both fundamental and applied problems relating to electrochemical energy storage systems and materials. These include: (a) lithium-ion, lithium-air, lithium-sulfur, and sodium-ion rechargeable batteries; (b) electrochemical super-capacitors; and (c) cathode, anode, and electrolyte materials for these systems.

What is the electrochemical Innovation Lab (Eil)?

Contact us to start a conversation. Funders and commercial partners include: Based in the Department of Chemical Engineering, the Electrochemical Innovation Lab (EIL) is a centre for accelerating impact, innovation, enterprise and research in electrochemical engineering.

What are polymer electrolyte membrane fuel cells?

Polymer electrolyte membrane (PEM) fuel cells are devices converting chemicals into electrical energy continuously, and are attractive in sustainable energy efforts, as they can use hydrogen potentially produced from renewable resources. Projects: Researchers: Recent Publications:

What techniques do we use to study electrolytes and solid-electrolyte interfaces?

Our group puts a significant emphasis on mechanistic studies and the utilization of advanced characterization techniques. We use in situ X-ray scattering and spectroscopy, FTIR and Raman spectroscopy, and electrochemical quartz crystal microbalance techniques to probe electrolytes and solid-electrolyte interfaces.

Why are stationary battery energy storage systems important?

The growing popularity of electric vehicles requires greater energy and power requirements--including extreme-fast charge capabilities --from the batteries that drive them. In addition, stationary battery energy storage systems are critical to ensuring that power from renewable energy sources is available when and where it is needed.

How can NREL improve the production of solid-state batteries?

To streamline the future deployment of solid-state batteries, NREL researchers are evaluating high-throughput techniques to optimize cell fabrication, such as roll-to-roll manufacturing. The current high-pressure, high-temperature batch processing used to create solid-state batteries is not suitable for large-scale manufacturing.

At the EIL, our research on supercapacitors encompasses both materials and full-cell analysis, aiming to enhance their performance and safety. By investigating and characterising new, ...

Electrochemical energy storage technologies are the most promising for these needs, (1) but to meet the needs

of different applications in terms of energy, power, cycle life, safety, and cost, ...

Under the Energy Storage Safety Strategic Plan, developed with the support of the Department of Energy's Office of Electricity Delivery and Energy Reliability Energy Storage Program by ...

It is the first large-scale professional laboratory in China established by national authorities to study safety technologies and real-world applications in electrochemical energy storage.

The growing demand for advanced electrochemical energy storage devices highlights challenges in battery materials, such as limited storage sites, slow ion/electron transport, and structural ...



**Electrochemical energy storage safety
laboratory**

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