

Energy Systems



ChemE researchers are developing the materials, devices, and systems necessary for meeting pressing energy challenges like climate change and rapidly increasing demand. As such, our work is vital in the transition to a decarbonized economy. Our faculty have a long track record of excellence in electrochemical systems, and are driving innovation in photovoltaics, batteries, fuel cells, and electronic polymers.

Energy-dispersive spectroscopy (EDS) of iron doped nickel hydroxy foam (Fe-NHF) electrocatalyst used in direct methanol fuel cells, direct urea fuel cells, and urea removal from dialysate. Image by Kelly Carpenter

Featured research clusters

Energy conversion processes

We examine processes related to electrochemical energy conversion in batteries and fuel cells, both experimentally and computationally. Our expertise encompasses fuel-cell and electrolysis-cell electrocatalysis; electrode reactions in batteries; battery management and diagnostics; and ion transport in solid polymer electrolytes.

Materials for photonic and electronic energy conversion

Solar cells, batteries, electrocatalysts, and flat panel displays depend critically on the structure and composition of nanomaterials for improved efficiency, power, and durability. Our research enables new technologies based on novel reacting systems and new families of devices such as flexible batteries and displays.

Large scale energy storage and utilization

We investigate how to meet electricity needs at the grid level through a wide variety of clean energy sources (wind, solar, hydro, and nuclear) and design effective charging stations and on-board batteries for fleet vehicles such as buses.

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 [More at
www.cheme.washington.edu/research/areas](http://www.cheme.washington.edu/research/areas)



Stuart
Adler



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Beck



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Bergsman



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Holmberg



Samson
Jenekhe



Jun
Liu



Jim
Pfaendtner



Jonathan
Posner



Lilo
Pozzo



Daniel
Schwartz



Eric
Stuve

Campus opportunities



Other research facilities:

- Photonics Research Center
- Molecular Analysis Facility
- Washington Nanofabrication Facility
- *Coming soon:* the multimillion-dollar Center for Advanced Materials and Clean Energy Technologies