

Advancing innovation in sustainable energy and battery research

McMaster University is at the forefront of sustainable energy, transportation and battery research and teaching. Backed by a number of programs, disciplines, and world-class research centres in the Faculties of Science and Engineering, McMaster's experts in electrification and clean energy are helping build a sustainable future powered by safe, equitable and reliable energy systems.

The Faculty of Engineering is an ideal collaborator on battery testing.

Dr. Saeid Habibi is a Tier one Canada Research Chair and the Director of the Centre for Mechatronics and Hybrid Technologies (CMHT), with one of the most advanced research labs on battery characterization and AI-based prognostics. He leads a number of large projects with OEMs and battery suppliers, including the Battery Workforce Challenge. He is the founder of EECOMOBILITY Inc., a leading battery test equipment manufacturer located at McMaster Innovation Park.

Experts in the Faculty of Engineering are focused on developing electrochemical energy technologies, including batteries, to achieve a sustainable energy economy.

Dr. Drew Higgins is an assistant professor in Chemical Engineering and leads a research program focused on addressing global energy challenges through the development of nanostructured active materials for batteries, including synthesis, advanced characterization and battery performance evaluation of newly developed materials.

He is an affiliated researcher at the Canadian Centre for Electron Microscopy (CCEM), which provides world-class electron microscopy capabilities for various applications, including the characterization of battery materials.

Dr. Phillip Kollmeyer is an assistant professor in Electrical and Computer Engineering. He leads a research group creating new electrical and thermal approaches to the design and management of battery packs using machine learning, physics-based modeling, and large-scale experimental investigations.

Partner with the Faculty of Science on battery development and energy storage.

Dr. Gillian Goward is a professor in Chemistry and Chemical Biology and Faculty of Science Research Chair in Magnetic Resonance of Materials for Energy Storage. Her group specializes in the characterization of lithium-ion batteries using real-time nuclear magnetic resonance (NMR) spectroscopy. Her team has demonstrated the quantitative detection of lithium-plating phenomena with exquisite precision in important cell chemistries and under various charging protocols.

Electric vehicles and battery management systems are key areas of focus for our experts in the Faculty of Engineering.

Dr. Ali Emadi, the internationally renowned Canada Excellence Research Chair Laureate, leads one of the world's top academic research programs in transportation electrification and smart mobility.

The program is hosted at the McMaster Automotive Resource Centre (MARC), which is equipped with a wide range of tools to enable advanced research in battery technology and electric vehicles - including battery cell, module, and pack testing facilities up to 160kW, with more than one hundred test channels and fifty micro and full-size thermal chambers.

Dr. Ryan Ahmed is an assistant professor in Mechanical Engineering, the deputy director of CMHT, and co-lead faculty advisor for the Battery Workforce Challenge. He is an expert in artificial intelligence, battery systems, electric and hybrid powertrains, and autonomous systems.

Related Centres & Institutes

McMaster Automotive Resource Centre
Canadian Centre for Electron Microscopy
McMaster Institute for Transportation & Logistics
McMaster Centre for Mechatronics & Hybrid Technologies
McMaster Centre for Software Certification

McMaster Institute for Energy Studies
McMaster Manufacturing Research Institute
McMaster Centre for Automotive Materials & Corrosion
Brockhouse Institute for Materials Research
Nuclear Magnetic Resonance Facility

