

# **COLLOQUIUM**

DEPARTMENT OF MATHEMATICS AND STATISTICS  
OAKLAND UNIVERSITY  
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## **Mathematical Modeling of Batteries for Automotive Propulsion**

### **Abstract**

Hybrid-electric and battery-electric vehicles are a growing segment of the automotive market, offering improved fuel efficiency with fun-to-drive performance. Mathematical models address diverse needs in the automotive arena, such as searching for battery designs that provide greater energy and power or informing vehicle design. In addition, on-board energy management requires a real-time battery model for state estimation and power prediction. This talk will outline the basic operating principles of lithium-ion batteries and discuss some aspects of the applicable mathematical models. Special attention will be given to the equivalent circuit models that are used in vehicle powertrain control.

**Tuesday, April 5, 2016  
3 – 4 PM  
Room 135 Dodge Hall**

(Refreshments at 2:30-3:00 PM in the kitchen area adjacent to 368 MSC)