College of Engineering

Department of Mechanical & Industrial Engineering

The Robert W. Courter Seminar Series

3:00-4:00pm, Friday, February 6, 2026

1253 Patrick F. Taylor Hall

Fuel Property Measurement and Characterization at the National Laboratory of the Rockies

by Gina Fioroni

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Abstract: Aviation, marine, and heavy-duty transportation sectors represent nearly half of the projected mobility energy demand in 2050 but are not easily electrified. The introduction of low-carbon and net-zero-carbon fuels offers the lowest cost pathway for rapid reduction in Green House Gas emissions from these difficult-to-electrify sectors. The Fuels and Combustion Science team at the National Laboratory of the Rockies is focused on unique experimental capabilities to characterize fuels used in various transportation technologies. Our research spans the gasoline, diesel, marine, and aviation sectors and utilizes experimental measurements along with computational simulations to predict fuel properties and performance. We recently expanded experimental capabilities to measure fuel properties over a wide range of temperature and pressure conditions to support more accurate simulations of engine combustion and performance. We aim to evaluate emerging fuels utilizing small volumes of sample reducing the risks of fuel process scale-up for the most promising candidates. An overview of the National Laboratory of the Rockies and a detailed discussion of recent research within the Fuels and Combustion Science team will be discussed.

Biography: *Gina Fioroni is the group manager for the Fuels and Combustion Sciences group at the National Laboratory of the Rockies. Fioroni joined NREL in 2009 and has worked in the fuels performance area, designing, and conducting experiments to analyze the quality and chemistry of alternative and low net-carbon fuels for the difficult-to-electrify aviation, marine, long-haul trucking, and rail sectors. Fioroni received a bachelor's degree in chemistry from Westfield State University, Westfield, Massachusetts, and a master's degree in organic chemistry from the University of Vermont in Burlington.*