PhD position at the University of Orléans

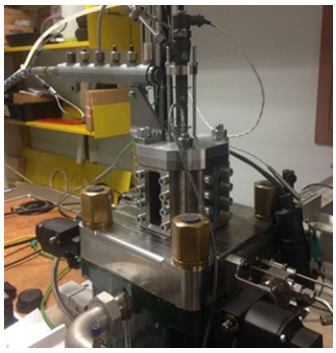
in Mechanical Engineering (Fluid mechanics and Energetics)

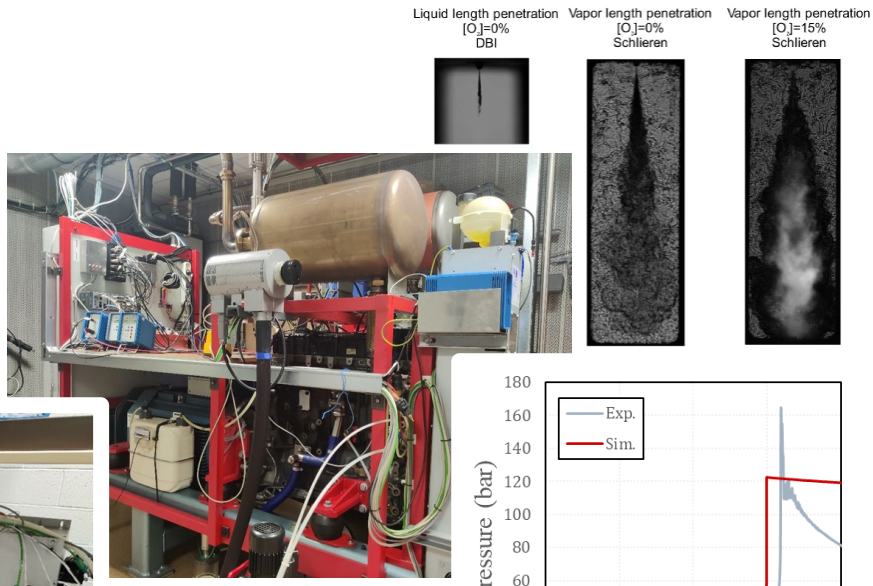
Analysis of the Impact of Nitrates-Based Additives on the Auto-Ignition of Ethanol, Methanol, and Ammonia.

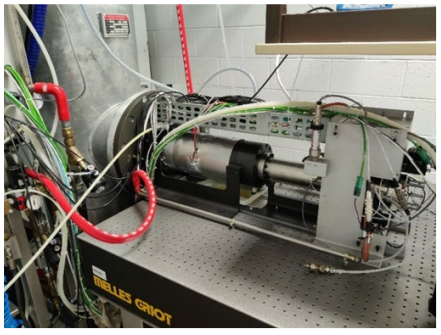
Application to Heavy Mobility.

On July 14, 2021, the European Commission adopted a set of ambitious and voluntary proposals to reduce its net greenhouse gas emissions by 55% by 2030 compared to 1990 levels and to achieve climate neutrality by 2050. Among industrial sectors, maritime transport, which has seen significant growth over the past 30 years, as well as rail transport and off-road sectors (such as construction and mining), have committed to drastically reducing their CO2 emissions. While battery-powered electric motors and hydrogen are promising solutions in some transport sectors, they cannot be considered when power and range are critical factors. Carbon-neutral fuels, such as ethanol, methanol, and even ammonia, can be used to power internal combustion engines. In the case of high-power engines, compression ignition, such as Diesel combustion, requires fuels that are conducive to self-ignition, which can be adapted by the addition of various additives.

The aim of the thesis proposed by Eurenco, the world leader in “Cetane Improvers”, in collaboration with the PRISME laboratory at the University of Orléans, is to study the impact of nitrogen-based additives on the ignition of ethanol, methanol, and ammonia. This experimental work, using a rapid compression machine, a high-pressure-high-temperature chamber, and single-cylinder research engines, aims to improve the understanding and prediction of the oxidation process of these fuels, and to validate kinetic and physical models.







Keywords: Green combustion; Compression Ignition engine, zero CO2, efuels

Academic supervisor	Pr. Fabrice FOUCHER, PRISME Laboratory, Université d'Orléans, France, fabrice.foucher@univ-orleans.fr
Doctoral School	École Doctorale EMSTU ED552 (Université d'Orléans)
Eurenco supervisor	Richard Samson
PhD location	PRISME Laboratory , Université d'Orléans, France
Duration and start date	3 years, starting in the fourth quarter of 2024
Employer	Eurenco
Language requirements	Fluency in French or English
Profile	Engineering degree or Master's degree in energy, fluid mechanics, or chemistry.

To apply, please send your cover letter and CV to the supervisors indicated here above.