Editorial Note on Combustion and Energy Systems

Michel Paul*

Department of Mechanical and Energy Engineering, University of Rwanda, PoBox 3900, Kigali, Rwanda

***Correspondence to:** Paul M, Department of Mechanical and Energy Engineering, University of Rwanda, PoBox 3900, Kigali, Rwanda. E-mail: maheshmaho@gmail.com

Received: January 04, 2021; **Accepted:** January 15, 2021; **Published:** January 22, 2021

Citation: Paul M (2021) Editorial Note on Combustion and Energy Systems. J Appl Mech Eng. 10:346. doi: 10.35248/2168-9873.20.9.340 10:346.

EDITORIAL

The Combustion and Energy Systems research groups conduct fundamental and applied research on problems in combustion, shock wave physics, heat transfer, and compressible gas dynamics.

Current research projects involve the combustion of alternative liquid fuels for automotive and aircraft propulsion; super-adiabatic combustion; combustion of solid particles with water for hydrogen production; particle combustion in air and fuel-air mixtures; thermal energy storage systems; loop heat pipes; heat transfer enhancement using microencapsulated, phase-change slurries; porous media; cooling of net-book computers; ultra-compact heat exchangers; optimization of heat transfer devices; fundamental propagation mechanisms of shock waves; detonations and explosions; computational modeling of hypersonic aerodynamics; high-speed propulsion; oblique-detonation combustion for scramjet engines; thermo-acoustics; and combustion noise.

Our primary facilities include the Alternative Fuels Laboratory, the Shock Wave Physics Group and the Heat Transfer Laboratory. The Alternative Fuels Laboratory is equipped with state-of-the-art laser diagnostic equipment (e.g., velocimetry and species diagnostics) for the study of the combustion of liquid biofuels for automotive and aircraft applications. It has equipment for gas chromatography and thermal gravimetric analysis, which are used for research on chemical reactions and product compositions. The Shock Wave Physics Group has equipment for the study of high-speed turbulent deflagration and detonation phenomena. For instance, there are high-speed photographic equipment, shock and detonation tubes, blast chambers, combustion synthesis apparatus, and solid particle combustion facilities. The Heat Transfer Laboratory has equipment and rigs for the study of fluid flow and heat transfer in interrupted change slurries. This includes surface ducts, mini-channels, porous media, solid-liquid phase change systems, loop heat pipes, and closed-loop thermo-siphons operating with microencapsulated phase. Thermo-

acoustic cooling equipment includes a gas chromatography system, NC water heaters, and accelerometers. Our groups have access to the CLUMEQ supercomputer system for large-scale simulations of high-speed and reacting flows.

The research is funded primarily by federal and provincial government programs, such as NSERC, CFI and FQRNT. The majority of our projects are conducted in collaboration with industrial and governmental partners, such as Pratt & Whitney, Rolls Royce, Intel, Martec Ltd., Allen Vanguard and the Canadian Space Agency.