



Faculty of Technology and Metallurgy,
University of Belgrade



University of Brighton



Centre for Automotive Engineering

P R E S E N T A T I O N

22nd April 2013 at 2 pm, Lecture hall on 3rd floor

Mono- and multi-component droplet heating and evaporation: hydrodynamic, kinetic and molecular dynamics models

Professor Sergei S. Sazhin



**Sir Harry Ricardo Laboratories, School of Computing, Engineering and Mathematics,
University of Brighton, Brighton BN2 4GJ, UK**

Professor Sazhin will present the recently developed approaches to the hydrodynamic, kinetic and molecular dynamic modelling of mono- and multi-component droplet heating and evaporation. New approaches is taking into account the effect of the moving boundary during droplet evaporation on droplet heating are discussed for both mono- and multi-component droplets. A simplified model for multi-component droplet heating and evaporation, based on the analytical solution to the species diffusion equation inside droplets is applied. A quasi-discrete model for heating and evaporation of complex multi-component hydrocarbon fuel droplets, and its application to modelling the heating and evaporation of realistic Diesel and gasoline fuel droplets are described. A new kinetic algorithm, taking into account the effect of inelastic collisions, is discussed. The results of applications of molecular dynamics simulations to study the evaporation of n-dodecane droplets is described. The most challenging and practically important unsolved problems with regard to the modelling of droplet heating and evaporation will be summarized and discussed.

The **Sir Harry Ricardo Laboratories** are one of the largest UK research teams dedicated to internal combustion engines, the development of laser-based measurement techniques, fundamental modelling and computational simulation. It is regarded as one of the foremost centres for automotive engine research in Europe. The group's international esteem is demonstrated by its breadth of collaboration with over 40 academic institutions and industrial partners across the world. <http://www.brighton.ac.uk/shrl/>



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