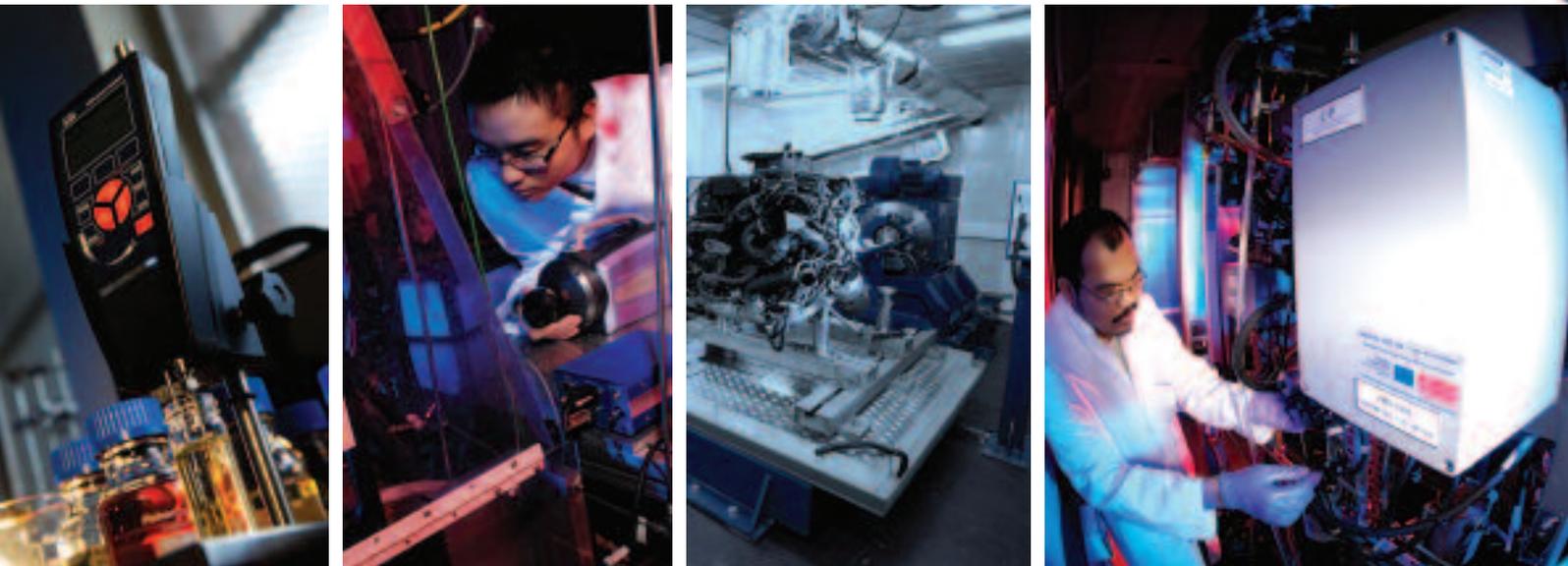


## SCIENCE CITY RESEARCH ALLIANCE

UNIVERSITY OF  
BIRMINGHAM

THE UNIVERSITY OF  
WARWICK



# FUTURE ENGINES AND FUELS RESEARCH

## The Future Engines and Fuels Laboratory

The Future Engines and Fuels laboratory, established by the Future Power Systems Group (FPS) based at the University of Birmingham, is home to leading edge research facilities and expertise relating to:

- applications of on-board fuel reforming to produce hydrogen for enhancing fuel combustion;
- development of homogeneous charge compression ignition technology and modelling methodologies;
- development of engines combusting fuel mixtures such as diesel-gasoline and diesel-biofuel, flexi-fuel engines including those using diesel mixtures with both first and second generation biofuels and gasoline-dimethylfuran-ethanol mixtures; and
- pre-treatment of fuel and after-treatment of emissions largely using on-board fuel reforming.

## FACILITIES OVERVIEW

The facilities available in the Future Engines and Fuels Laboratory include several single- and multi-cylinder research diesel, SDI and HCCI engines, some with prototype features such as cam profile switching and multiple direct injection of fuel. All the engines are fully instrumented for diagnostics of combustion characteristics, performance and emissions. State-of-the-art HCCI/SI optical engine and constant volume optical chambers allow for advanced optical diagnostics of flows, sprays and combustion. Extensive emissions diagnostics facilities range from standard and fast gaseous diagnostics through particulate emissions to chemical speciation of fuels/emissions and particulates with an integrated TGA/GC/MS facility. Several prototype fuel reforming facilities of different sizes are in operation.

## WORLD LEADING EXPERTISE

- Group founder, Professor Miroslaw Wyszynski, holds the Institute of Energy Research and Policy Chair of Novel Vehicle Technology and specialises in fuel reforming, modelling and advanced alternative fuels;
- Professor Hongming Xu holds the Chair of Energy & Automotive Engineering. With 6 years industrial experience at Jaguar Land Rover, he is expert in optical diagnostics of flow and combustion as well as various advanced engine technologies.
- Dr. Athanasios Tsolakis, a Senior Lecturer in Automotive Engineering, has research interests in fuel reforming for pre-treatment, combustion and diesel emissions control for alternative fuels; and
- Dr. Karl Dearn, a Lecturer in Mechanical Engineering has research interests in geared transmissions, tribology and future powertrains.

Since its establishment 20 years ago, the Future Power Systems Group has worked with many industrial partners – examples go back to Rover and now include Jaguar Land Rover, Johnson Matthey, Ford, Shell Global Solutions, Green Fuel and a number of smaller companies in the biofuels and engine development areas. Our University partners range from our Science City Research Alliance partner University of Warwick to universities such as Oxford, Brunel, Cardiff, Castilla La Mancha, Valladolid and Warsaw.

We welcome opportunities to form new partnerships and collaborations.



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European Union



New research equipment housed in The Future Engines and Fuel Laboratory are part of the Science City Energy Efficiency and Demand project funded by Advantage West Midlands and the European Regional Development Fund. The project is part of a wider investment in research infrastructure of the West Midlands region, which unites the Universities of Birmingham and Warwick in the newly-formed Science City Research Alliance.