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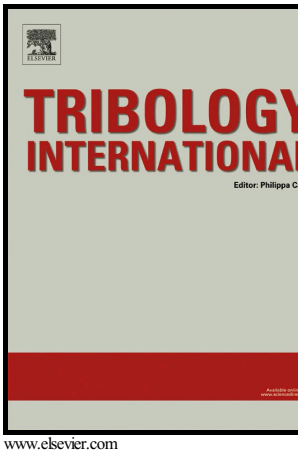

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INTRODUCTION

The 41st Leeds-Lyon Symposium on Tribology was held at Leeds Trinity University in Leeds (UK) under the title "*Integrated Tribology*" from Tuesday 2nd September until Friday 5th September 2014.

What constitutes acceptable friction (simple resistance to motion, energy efficiency or energy loss) and acceptable wear (in terms of useful life and reliability) is constantly evolving. This increases the pressure on the science and engineering of tribology to deliver solutions for a growing range of applications. We now strive to examine surfaces and lubricants at a molecular level, using advanced experimental tools and mathematical models, and scale up the observed phenomena and mechanisms to the macroscopic scale of engineering systems. When working at a molecular level the problem becomes truly multidisciplinary with inputs required from engineers, physicists, chemists, biologists, material scientists, mathematicians and computer scientists. So collaboration across a wide range of disciplines and across the various stages of technology development, often termed Technology Readiness Levels, is growing. In the future, tribology must become truly integrated in science and engineering across

- *Length scales*, science from the molecular scale applied to the performance of full scale engineering and biological systems.
- *Scientific disciplines*, incorporating computer science, chemistry, engineering, mathematics, materials science, physics, and biology.
- *Technology Readiness Levels*, from fundamental science to final product development.
- *Industry sectors*, such as automotive, rail, marine, energy, process and healthcare.
- *Product lifecycles*, from design and conception, through effective monitoring, maintenance and life extension, to recycling and final disposal.

A total of 171 delegates from 19 different countries attended the Symposium and provided a truly international and wide ranging perspective on the latest tribology research relevant to this theme. A full list of the delegates and their affiliations is provided towards the end of this Special Issue.

The two keynote papers were deliberately chosen to provide a contrast in approach across length scales. The first was presented by Rob Dwyer-Joyce (University of Sheffield, UK) who described the innovative development and application of piezo-electric ultrasound sensors to investigate lubricated interfaces in real engineering components, such as the piston ring-cylinder wall sliding interface in an