Editorial

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Biographical notes: Manish Roy graduated from Indian Institute of Technology, Kharagpur in 1985. He has received his PhD from the same institute. He has visited University of Strathclide, UK, Vienna University of Technology and Austrian Center of Competence for Tribology, in various capacities. His areas of interest are materials and surface engineering for ambient temperature and elevated temperature tribological applications, corrosion and high strain rate deformations. He is a member of the editorial board of three international journals. He has brought out special issues of several international journals as guest editor. He has around 80 publications in various international journals.

J. Paulo Davim received his PhD in Mechanical Engineering from University of Porto in 1997 and the Aggregation from University of Coimbra in 2005. Currently, he is an Aggregate Professor in the Department of Mechanical Engineering of the University of Aveiro and the Head of MACTRIB – Machining and Tribology Research Group. He has more than 24 years of teaching and research experience in manufacturing, materials and mechanical engineering with special emphasis in machining and tribology. He is the Editor of five international journals, Guest Editor, editorial board member, Reviewer and Scientific Advisory for many international journals and conferences. He has also published more than 300 articles in journals and conferences (more than 150 articles in ISI Web Science, h-index 15).

Effort to miniaturise optical, electrical and mechanical components has been ongoing research for last several decades. Development of processing technologies for semiconductors, actuators, microprocessors, sensors, mechatronics, etc. has revolutionised technologies for MEMS, smart structure, micro pumps, micro engines, micro biomedical devices etc. These devices have ability to sense, detect, compute, activate in real-time. These micro components have very high surface to volume ratio. The forces applied to such systems are quite low making surface forces to play a dominant role. However, as the sizes of such systems are quite low, the contact pressure is estimated to be few hundred MPa. Such forces cause undesirable effects such as

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stiction and high friction leading to reduction of operational reliability. It is for these devices nanotribology and nanoindentation becomes relevant.

Nanotribology which deals with the friction wear and lubrication of interacting surfaces in relative motion at the nanometre scale is fast advancing in recent days. Many phenomena in nanotribology pose new challenges in concept as well as in practice. Although conventional tribology is well established nanoindentation, nanomechanics and nanotribology is evolving rapidly. With the invention of the probe based microscopes and the nanoindentation techniques study of nanomechanical properties and nanotribology has rapidly become a routine laboratory testing method for characterising material surfaces and coatings for miniaturised systems.

At this juncture, it is considered to be timely to bring out a special issue on ‘nanoindentation and nanotribology’ in this journal. After a rigorous review process, five articles were selected for inclusion in this special issue.

We would like to express our appreciation to the contributors and reviewers of the papers for their strong and valuable efforts. Special thanks also should be given to editorial staff of the journal for their kind support.