

## PREFACE: SPECIAL SECTION ON TRANSPORT PHENOMENA

Engineering and technological advancement typically relies on either one of two distinguishable modes: Inspired synthesis of known phenomena, typically termed “design and development”, and insightful *heuresis* and exploitation of new phenomena by means of analyzing and abstracting (modeling) otherwise known phenomena and their couplings (Spitas, 2011), typically the object of “research and development”. Although the significance of existing knowledge and the “shock of the old” (Edgerton, 2006) in the first case must never be underestimated, it is the latter case that inspires this special section of the journal, which focuses on emerging scientific insights into coupled heat and mass transfer in selected different technological contexts. Each of these insights is meant to constitute an opportunity in the developing state of the art.

To this end a set of four invited papers are presented, dealing with computational models for fuel production by gasification of biomass, fine mist cooling of high tem-

perature materials, journal bearing operation modification by microgrooves, and heat transfer in viscoelastic orifice flows. These topics were selected so as to cover a relatively diverse (although by no means exhaustive) range of applications. While these are fully-fledged scientific papers in their respective research topics in their own right, the particular significance of the contributions to this issue lies in their direct technological implications of exploiting couplings between heat and mass transfer towards higher performance or efficiency.

### REFERENCES

- Edgerton, D., *The Shock of the Old: Technology and Global History since 1900*, London: Profile Books Ltd, 2006.
- Spitas, C., Analysis of systematic engineering design paradigms in industrial practice: Scaled experiments, *J. Eng. Des.*, vol. 22, no. 7, pp. 447–465, 2011.

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