Editorial

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The main objective of computational materials science is the computer simulation of material properties. One of the most significant achievements of this science is the aptitude to predict materials properties with a level of accuracy and reliability near to that of the experiments. In the last two decades, this science has achieved a significant development and the main purposes can be summarised as follows:

1 investigate problems in materials theory and modeling with novel computational approach

2 develop powerful tools for the prediction of material properties

3 accelerate new materials development

4 reduce time and cost of the experiments in industrial research.

This issue collects nine contributions on computer modelling in the fields of metallurgy, materials science and engineering materials. Two manuscripts are dedicated to the application of neural network simulation to the materials characterisation: force and torque prediction in hot drilling of 6082 alloy and the forecast of materials properties with case studies of superplasticity, fatigue and compressive behaviour of Al foam. One paper deals with numerical simulations of welding properties while in another one the attention is focused on filling simulation and mechanical property prediction in the injection moulding of LGFRP. Some design methods of corrugated board containers are discussed too. Pin squeeze casting process has been modelled (cycle time and cast property prediction) and tube bending processes were analysed by a numerical-experimental approach. Finally, one paper deals with shape memory alloy, paying attention to three-dimensional modelling, computational aspects and design of devices.

This special issue is relevant not only to researchers but also to postgraduate and final year undergraduate students of materials science.

The guest editor would like to thank all the authors for their contributions, and the referees for the constructive comments on the papers.