The industry is increasingly requiring factories to reduce production times and costs when developing their products. The modifications and automations of existing and new solutions require analysis and specific research. The comprehensive issues can be solved successfully by implementing a numerical methods solution. In actuality, most problems in engineering and technological investigations can be treated only by using numerical simulations. The computational methods developed are widely used by scientists. The adequate control of the production processes is a very important factor. Regulating the production process is inherent to the quality of the final product and, ergo, a critical factor in the success of the company.

The articles included in this special issue have been selected from the research investigations presented at the PRO TECH MA 2015 conference which took place on 7–9 October 2015 by the faculty of the Mechanical Engineering school at the Technical University of Kosice, where researchers had an opportunity to exchange their knowledge, experience, and present new ideas of the design, automation, material research, the use of the optimization techniques and modern industrial production technologies. The articles presented are concerned with the physical phenomena - at the macro and micro level - that occurs during the formation of several materials, specifically those with unique mechanical properties.

It was a great pleasure to work as a Coordinating Editor of the “Methods and Applications in Mechanical Engineering” special issue. All of the articles published in the special issue have been reviewed according to the Open Engineering journal procedures. I wish to thank the reviewers for their work related to the review process.

Jacek Mucha: Faculty of Mechanical Engineering and Aeronautics, Rzeszów Uniwesity of Technology, 35–959 Rzeszów, al. Powstańców Warszawy 8; Email: j_mucha@prz.edu.pl