

This special issue of the *International Journal of Numerical Methods for Heat and Fluid Flow (IJMHFF)* comprises selected papers presented during the *Eurotherm Seminar No. 109 – Numerical Heat Transfer 2015*. The Conference was held on 27-30 September, 2015 in Warsaw, Poland, and it was the 3rd conference in the series, following the previous meetings in Cracow (2005) and in Wrocław (2012). Both the Scientific Committee Members and the Participants came from 17 countries all over the world.

The conference was organised under the auspices of the *EUROTHERM Committee*. The aim of the *EUROTHERM Committee* is to promote and foster European cooperation in thermal sciences and heat transfer by gathering together scientists, graduate students and engineers working in specialised areas of heat transfer.

The special issue consists of 12 papers which have been selected to demonstrate, on the one hand, an overview of the conference topics and, on the other hand, to present few hot and important topics in numerical heat transfer. One of them is the computational modelling of fluid flow and heat transfer problems encountered in living organisms. As an example of this kind of problems can be CFD modelling of thrombus transport in a ventricular assist device. This type of analysis can be even seen as a multi-scale strategy to surgical planning for palliative treatment of the most common type of congenital heart disease encountered in infants.

Another important and very challenging topic being dealt with in this special issue is the numerical simulation of free jets. Investigators show complexity of seemingly simple jet-type flow and prove that despite the huge interest in these flows and relatively in-depth knowledge on the jet dynamics, there remain some open issues requiring further studies.

The issue also contains a few papers coping with theoretical and computational aspects of the radiative heat transfer. Particularly, problems of identification of radiative properties, problems of thermal protection including protective garments and implementation of spectral line-based weighted sum of grey gases (SLW) model are discussed in those papers.

Two papers in this special issue show progress in computational models of reacting systems. The first study examines application of thermochemical carbon dioxide capture and energy storage system, while in the second paper, the operation of the rock melting cupola used in mineral wool production is simulated.

Finally, the above-mentioned papers are supplemented with papers discussing transient coupled thermoelasticity, film cooling occurring in gas turbine, the Bridgman solidification process for alloys and fast depressurization process caused by loss of coolant accident in the nuclear reactor.

I am indebted to all authors for their contributions to this special issue, for their cooperation and support. I do hope that this issue provides a window on the current interests in numerical heat transfer which is a fascinating research area. I would also like to thank Professor R.W. Lewis, Editor-in-Chief, for giving me the opportunity to edit this special issue. I am also very grateful to the editorial staff of the *IJMHFF* for highly professional handling of this special issue.

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