

Preface

The topical volume “Transfer Phenomena in Fluid and Heat Flows VII” of Defect and Diffusion Forum covers in a wider sense diffusion related phenomena, primarily related to fluid flow and heat conduction and convection. The engineering field of heat transfer and fluid flow is nowadays equally important compared to classical solid mechanics. Many essential engineering applications, for example, from the context of energy conversion, e.g. in car engines, airplane turbines or electrical power plants are essentially dependent on the process in the mentioned disciplines to increase their efficiency or to work “greener” with lower emissions. There are still two approaches which work “hand-in-hand”, these are theoretical predictions (including numerical simulations) and experimental investigations. Nevertheless, there is a strong trend to move more and more in the direction of numerical simulations and to limit the experimental approach to some particular cases, many times in order to verify or benchmark the theoretical predictions. A major driving factor is the higher flexibility of computational tools and the better cost efficiency. A closely related field is the development of modern materials, for example, metal alloys which outperform classical engineering materials. A typical example are alloys which allow a higher temperature in turbines to increase the efficiency. All the above mentioned fields undergo extremely quick changes. Thus, the aim of this topical volume is to collect recent advancements and improvements and provide a compact and up-to-date form.

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