

Preface

Role of Visualization in Fluids and Thermal Engineering



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The Journal of Visualization has been established to promote understanding of various complex phenomena with the aid of interdisciplinary imaging science and technology. This particular issue contains ten contributed papers and six photogravure pages, which fall broadly within the area of fluids and thermal science and engineering. As is well known, visual observation was already playing an important role in diagnosing various flows more than a hundred years ago; a typical example was the O. Reynolds' experiment of laminar-to-turbulent flow transition in a pipe. This fact can be recognized as a quite reasonable consequence, if one is aware that any physical interpretation of flow phenomena should need knowledge on the degree of spatial extension of phase relationship, e.g., two-point correlation of flow variables.

However, it was only about a decade ago that qualitative flow visualization had grown to powerful quantitative measurement techniques such as particle imaging velocimetry and Laser induced fluorescence. It was almost the same time that large-scale numerical simulation of complex flow phenomena such as turbulent and multiphase flows had become another research tool to explore detailed physics in fluid and thermal problems. Currently, both experimental and computational flow visualization techniques are being used extensively in analyzing and exploring flow and transport phenomena, and also in designing various mechanical devices and equipment. This trend will continue to grow, and the use of sophisticated visualization techniques should be indispensable for the future progress in fluids and thermal engineering. I hope these papers herein published provide a nice collection of some of the best contemporary research in visualization of fluid and heat flow.

Managing Editor

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