

PREFACE

Recent development of industrial applications in microelectronics, laser systems, micro-heat exchangers, and micro-devices (sensors and actuators), have led to studies dealing with microscopic behaviour of thermal phenomena in many different fields: fluid dynamics in micro-conduits, radiative heat transfer, molecular heat transfer, microscale measurement, microscale material properties, molecular dynamics, micro-chemical systems, etc. Recent research results reveal that the physical mechanisms of thermal transport in extremely small length and extremely short time could differ sensibly from those in the macro-scale world. Our knowledge of the thermal phenomena in the micro-scale world is limited, and, as a result, it is difficult or impossible to properly design miniaturised devices. On the other hand, thermal phenomena in micro-scale are extremely complex to be studied and they concern length and time scales which can differ enormously among the investigators (from micro to nano down to molecular level).

This is the first Conference dedicated on this emerging field organised by the United Engineering Foundation. The Conference brings together a good mix of participants from industry and academic organisations from 14 countries. The Conference program includes the following: 9 Keynote lectures and 67 papers. The Conference objective is to address the state-of-the-art knowledge in the field of heat transfer in extreme conditions involving very small scale, both at space level and at time level. The Conference intends to provide a forum for scientists from academia and people from industry to present and discuss recent advances in their research on thermal phenomena in micro scale.

The book is divided into the following sections.

Single-Phase Flow Heat Transfer in Channels
Heat and Fluid Flow
Pressure Drop
Boiling Phenomena
Transport Phenomena
Heat Transfer Applications
Industrial Applications and MEMS
Thermal Radiation
Material and Thermophysical Properties
Molecular Dynamics

We appreciate the efforts and assistance offered by the Scientific Committee who took the responsibility of encouraging people from industry and academic organisations to present papers.

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