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Preface

The 3rd United Engineering Foundation Conference on Turbulent Heat Transfer was held on 18–23 March 2001 at the Alyeska Resort in Girdwood, Alaska. The meeting attracted participants from Europe, the Pacific Rim and Australia and the United States. The program consisted of sessions dealing with Direct Numerical Simulation (DNS) and Large Eddy Simulation (LES), turbulence modeling, experimental studies and techniques for gas turbines, and heat exchange applications. Single, two-phase and reacting flows were discussed. Eight papers have been selected for inclusion in this special issue. The papers have been revised and expanded. The revised manuscripts have been reviewed externally in accordance with the Journal's standard operating practice.

The first paper is an overview of computational heat transfer research on gas turbine airfoils at NASA Glen Research Center. It is followed by an experimental study verifying that high free stream turbulence levels greatly augments heat transfer in the first stage gas turbine vane. A report on progress made in the development of an analytical representation of the transport of heat and momentum across the near-wall sublayer of a turbulent flow without having a very fine near-wall grid follows.

The next two papers delineate the use of advanced numerical simulation techniques in turbulent flows with heat transfer. DNS has been used to determine temperature profiles in moderate to high Prandtl number fluids in turbulent channel flow. The dynamics of flow and heat transfer over a matrix of heated cubes was determined using LES.

The last three papers in this issue describe experimental studies. The influences of system rotation on heat transfer in transitional and turbulent zero pressure gradient boundary layers was studied. The enhancement of heat transfer on a concave boundary layer by Görtler vortices was reported. The issue concludes with a paper describing the measurements of the flow and temperature fields of a highly heated jet of air.

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