

Russell J. Donnelly
Katepalli R. Sreenivasan

Editors

**Flow at Ultra-High
Reynolds and Rayleigh
Numbers**

A Status Report



Springer

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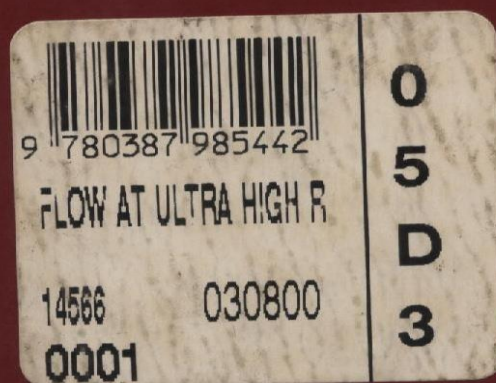
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Flows involving very high speeds (as in aerospace applications) or very large scales (as in modeling of atmospheric flows) are characterized by very large Reynolds numbers. Because of the inherent limitations of air and water as the working fluids, it is not possible to simulate such flows realistically in the usual wind and water tunnels. One way to overcome some of the problems is to use liquid helium and gaseous helium near the critical point, which have the lowest kinematic viscosity of any known substance. The first report on this subject was given in *High Reynolds Number Flows Using Liquid and Gaseous Helium*, Russell J. Donnelly, Editor (Springer-Verlag, 1991). The present book is a further status report on the same topic.

The papers included here cover a wide range of issues: fundamental studies of the turbulence problem, practical applications of turbulence, superfluid turbulence, cryogenic facilities and capabilities to support the demands of cryogenic turbulence research, and new types of miniature flow instrumentation. All of these topics are crucial for high-Reynolds-number research. The papers give a state-of-the-art assessment of the use of helium flows—on the one hand, for turbulence research at very high Reynolds and Rayleigh numbers and, on the other, for testing navy and aerospace models under realistic parameter ranges. The editors have provided two survey papers, and a number of pioneering papers are included.



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