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Sommario/riassunto

This book provides the fundamental knowledge allowing students in engineering and natural sciences to enter fluid mechanics and its applications in various fields where fluid flows need to be dealt with. Analytical treatments of flows are provided based on the Conventional Navier-Stokes-Equations (CNSE). The physics and mathematics of fundamental flow problems are explained in such detail that the reader receives a good introduction into the subject. Numerical methods and experimental techniques, applied in fluid mechanics, are also introduced. This second edition of the book stresses that the CNSE are incomplete. They are missing molecular transport terms. These terms are derived in the book to yield the Extended Navier-Stokes-Equations. These equations allow flows with strong fluid property gradients to be treated correctly, while the CNSE do not allow this. The main benefit the reader will derive from the book is a sound introduction into various aspects of fluid mechanics.