Preface

On November 3, 2005, Alexander Vasil’evich Kazhikhov left this world, untimely and unexpectedly. He was one of the most influential mathematicians in the mechanics of fluids, and will be remembered for his outstanding results that had, and still have, a considerably significant influence in the field. Among his many achievements, we recall that he was the founder of the modern mathematical theory of the Navier-Stokes equations describing one- and two-dimensional motions of a viscous, compressible and heat-conducting gas. A brief account of Professor Kazhikhov’s contributions to science is provided in the following article “Scientific portrait of Alexander Vasil’evich Kazhikhov”.

This volume is meant to be an expression of high regard to his memory, from most of his friends and his colleagues. In particular, it collects a selection of papers that represent the latest progress in a number of new important directions of Mathematical Physics, mainly of Mathematical Fluid Mechanics. These papers are written by world renowned specialists. Most of them were friends, students or colleagues of Professor Kazhikhov, who either worked with him directly, or met him many times in official scientific meetings, where they had the opportunity of discussing problems of common interest.

We shall not give the detailed description of the results presented in this volume, but, rather, we shall only give a short list of the main areas where these results have been obtained. These areas range from boundary value problems for different types of fluid dynamic equations, to certain models describing the properties of compressible flows, to limits of different kind with vanishing parameters. They also include control problems for fluid flow, stability problems for equilibrium figures of a liquid, problems connected with elastic bodies, Poisson-Boltzmann equation, and problems with insufficient information about initial and/or boundary data.

In many articles the reader will find an account of the state-of-the-art of the corresponding disciplines that may serve as a stimulating starting point for further research.

Also for this reason, we believe that this volume could be helpful to specialists as well as to researchers who would like to become acquainted with certain aspects of Mathematical Fluid Mechanics.

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