PREFACE

This issue is the collection of some presentations at the International Conference on Physics of Dusty and Combustion Plasmas "Dusty Plasmas in Applications" held in Odesa, Ukraine, August 25—28, 2004.

Recently, much interest has been generated to the studies of plasmas with fine-dispersed liquid or solid objects. Such a kind of plasma is usually called dusty plasma or complex plasma. Dusty plasmas are widely presented in the nature and laboratories. The main feature of dusty plasmas is that dust particles can accumulate a giant electric charge which self-consistently depends on the plasma dynamics. Especially strong effects on plasma can be produced by dust particles in technological devices. In particular, dust particles are present in plasmas which appear in the course of combustion of a dispersed fuel and, in turn, considerably influence combustion processes. This special kind of dusty plasma is called smoky plasma.

The strong coupling between dust particles and plasma generates a variety of new interesting phenomena such as new collective linear and nonlinear modes (for example, dust-acoustic waves and ion-dust-acoustic waves), anomalous dust particle heating, a specific interaction of highly charged grains, formation of various structures (dusty crystals, dust clouds, voids, etc.). This ensures a wide field of research at the interdisciplinary level.

The Conference was attended by more than 70 participants from various countries (Australia, Germany, Italy, Japan, the Netherlands, Russia, Ukraine, and USA). The leading teams from the Institute of High Energy Densities of the Russian Academy of Sciences and Max Planck Institute for Extraterrestrial Physics were represented among others.

The Conference scope included the following fields: general problems of kinetic description, the numerical simulation of dusty plasmas; transport properties of dusty plasmas; interactions between dust particles in plasmas; the application of dusty plasmas to the derivation of fine powders; the collecting of particles from gas and plasmas, etc.

We would like to thank all the participants for their presentations and hope to see them at the next Odesa Conference in 2006.

Organizing Committee