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Dynamics of Concentrated Systems

Preface

There are striking similarities in the dynamic behavior of multiparticle systems at different size scales. Hard-sphere molecules, solutions of rodlike polymers, suspensions of rigid particles, granular flows, and particle-reinforced solids share many behavioral features which point to the existence of scale-independent physics. This scale independence is further evidenced by the fact that insights and techniques developed for the microscopic level can frequently be applied to the macroscopic level, and vice versa.

The Dynamics of Concentrated Systems Workshop was held at Los Alamos National Laboratory on 13–15 June 1989. The purpose of this workshop was to examine the remarkable connections and overlap between the different size scales encountered in the dynamics of concentrated systems. This workshop brought together over 100 leading researchers from a rather wide variety of scientific and engineering disciplines. The workshop focused on recent developments in the theory, computations, experiments, and applications of discrete systems at concentrations for which multibody interactions dominate the system responses. This issue contains papers for selected presentations given at the workshop.

We are indebted to a number of individuals and organizations for the success of the workshop. Foremost are the conference participants, with their stimulating presentations and lively discussions. Financial suport, facilities, and administrative support were provided by the Center for Nonlinear Studies, the Center for Materials Science, and the Design Engineering Division at Los Alamos National Laboratory. Staff support for workshop activities was also provided by the Mechanical and Electronic Engineering Division and the Theoretical Division at Los Alamos National Laboratory. We appreciate the backing and support of D. K. Campbell of the Center of Nonlinear Studies, D. M. Parkin of the Center for Materials Science, and G. G. Hill of the Design Engineering Division. We are indebted to M. V. Martinez, M. F. Gomez, B. A. Rhodes, and L. K. Crane of the

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Center for Nonlinear Studies for their tireless administrative support, which was vital to the success of the workshop.

We believe that the workshop successfully fulfilled its purposes of (1) establishing dialogues and interactions between researchers in rather diverse fields of scientific and engineering research and (2) elucidating recent developments of mutual interest in the dynamics of concentrated systems. Many of these insights and developments are found in the following articles, which have been written with the view of presenting information in a form appropriate for the nonexpert technical reader. For completeness, the workshop program is provided at the back of this issue.

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