

Introduction

The fundamental concepts in fluid mechanics offer an approach for thinking about a wide range of flows and physical problems. Some topics appear in multiple fields of study and applications and have been studied for decades, for example, high-speed flows, bubbly flows, drop impact, the flow of granular materials, multiphase turbulence, and fluid-elastic interactions, to name a few. In addition, some topics bridge fluid mechanics to other science disciplines, for example, the study of flows in planetary atmospheres, biological flight (from insects to birds), and the motions of microorganisms. These are some of the topics that are surveyed in Volume 56 of the *Annual Review of Fluid Mechanics*.

Nevertheless, the list of interesting and societally relevant topics often seems limitless, as fluid dynamicists identify questions into which their tools and approaches can offer new insights. Thus, in Volume 56 we read about building ventilation as it affects personal exposure and airtanker firefighting, both topics relevant to recent destructive events; ablative thermal protection systems, which is one of the themes important to the resurgence of interest in hypersonics; fluid dynamics of female reproduction, which can offer insights into improvements in health and medical procedures; and models for understanding the data that are generated in research. The history of subjects is always interesting, and in this volume a reader will find a look back at the evolution of turbulence simulations, which have become an indispensable tool in research alongside theory and experiments. Finally, readers can learn more about the life and the fluid dynamical contributions of the late Stephen H. Davis, who served the fluid dynamics community in myriad ways, including 20 years as Co-Editor of this journal. Our subject remains rich in intellectual ideas, broad in the applications to which the ideas, experiments, and simulations apply, and creative in the way our colleagues bring their training to bear on new questions.

Howard A. Stone and Parviz Moin
Co-Editors