Preface

On June 06–09, 2013, the EUROMECH Workshop *Similarity, Symmetry and Group Theoretical Methods in Mechanics* took place in Varna, Bulgaria.

It brought together many scientists from European countries and USA, and focused on the current state of the art in the field of similarity methods in mechanics. The aim of this Workshop was to bring together researchers who apply similarity and symmetry analysis to theoretical and engineering problems in both solid and fluid mechanics, researchers who are developing significant extensions of these methods so that they can be applied more widely, and numerical analysts who develop and use such methods in numerical schemes.

The scientific program of the Workshop was built around main speakers who gave an overview of the field in the form of short lecture courses delivered by

Nail H. Ibragimov—Group Analysis as a Microscope of Mathematical Modeling,

George Bluman—Some Recent Developments in Finding Systematically Conservation Laws and Nonlocal Symmetries for Partial Differential Equations, and

Charles-Michel Marle—Symmetries of Hamiltonian Dynamical Systems, Momentum Maps and Reduction.

The two organizers are deeply grateful to EUROMECH for the provided support making possible the first in this new series of scientific meetings. This Springer volume contains lecture notes written by the principal speakers of the Workshop which are complemented by a few shorter contributions dealing with specific problems.

The Editors hope very much that this volume gives a modern overview of the similarity and symmetry methods and shows applications of this active field of research in mechanics and will serve as a reference in the years to come.

Nancy, April 2014 — Jean-François Ganghoffer

Sofia — Ivaïlo Mladenov