

Preface

Generalized Continua have been in the focus of scientists from the end of the nineteenth century. A first summary was given in 1909 by the Cosserat brothers. After World War II, a true renaissance in this field occurred with the publication of Ericksen and Truesdell in 1958. Further developments were connected with the fundamental contributions of scientists from Germany, Russia, and France. During the past years the centennial of the Cosserat book was celebrated by two colloquia, both held in Paris in 2009. In addition, previous trilateral seminars *Mechanics of Generalized Continua—from Micromechanical Basics to Engineering Applications* (Wittenberg 2010, 2012) and the CISM Course *Generalized Continua—from the Theory to the Engineering Applications* (Udine 2011) discussed problems related to the theory and applications. During a new Advanced Seminar (Magdeburg, September 2015), attention was paid to the most recent research items, i.e., new generalized models, materials with a significant microstructure, multi-field loadings, or identification of constitutive equations. Last but not least, a comparison of discrete modeling approaches have been discussed.

This book contains 21 papers submitted to the Advanced Seminar *Generalized Continua as Models for Materials with Multi-Scale Effects or Under Multi-Field Actions* or discussed during the seminar. Finally, after reviewing and acceptance they were collected as a unique collection of papers. The authors are from France, Germany, and Russia, the traditional countries of the previous trilateral seminars, completed by authors from Egypt, Estonia, Finland, Great Britain, Italy, and the United States.

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