

Preface

Multiscale modeling methods play a decisive role in both the industrial and academic sectors within the context of actual issues involved in the design and optimization of engineering components, materials and processes at different length and time-scales. A fundamental understanding of all mechanisms interacting on different length and time-scales in the materials considered is required for an optimal adjustment of the material and structural characteristics by means of controlled production and processing steps. Considerable research work is still necessary both in theoretical and in computational material mechanics in order to formulate the corresponding models and algorithms.

The 5th Seminar "Multiscale Material Modeling" took place at TU Kaiserslautern, Germany from June 30 to July 1, 2011. The meeting was organized by the activity group "Multiscale Material Modeling" of the German Society for Applied Mechanics and Mathematics (GAMM). This seminar was attended by 34 scientists from 14 research institutions (http://mechanik.mv.uni-kl.de/deutsch/kolloquien/gamm_seminar.html). This volume documents selected research work presented at the Seminar.

The activity group "Multiscale Material Modeling" is currently being chaired by Thomas Böhlke (KIT - Karlsruhe Institute of Technology, Germany) and Stefan Diebels (Saarland University, Germany). Its purpose is to provide a forum for scientific interaction and cooperation in the area of multiscale modeling. The activity group hosts a seminar once a year and organizes the Section "Multiscale and Homogenization" at the annual conferences of the German Society for Applied Mechanics and Mathematics.

Thomas Böhlke, editor of this volume
Stefan Diebels, editor of this volume
Albrecht Bertram, editor of Technische Mechanik