

# Preface

At the time this book is published, the world is experiencing the most spectacular rate of technological developments ever seen in history. This scenario demands a continuous enhancement of engineering materials in order to obtain improved or new mechanical, electrical or, in a more comprehensive sense, thermo-physical properties. Technological achievements usually rely on previous scientific developments and give support to engineering needs. Thus, we can talk of *engineering tailored materials (ETM)* or *advanced engineering materials (AEM)*, which include the former.

This book presents 14 chapters centered in AEMs, covering subjects such as new manufacturing processes or aspects of their computational modeling, optimization procedures aimed at the obtainment of tailored properties, and computational modeling of constitutive behavior. In particular, the book is divided into four different parts: Part I—Micro and Nanoscale Modeling (3 chapters), Part II—Biological Tissues (4 chapters), Part III—Porous and Multiphase Materials (4 chapters) and Part IV—Polymers (3 chapters). The contributions belong to researchers from nine countries: Argentina, Australia, Brazil, Canada, Chile, Colombia, Germany, Poland, and Spain.

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Finally, I wish to dedicate this book to the memory of Prof. Domingos Boechat Alves, from the Federal University of Santa Catarina and Prof. Jun Sérgio Ono Fonseca, from the Federal University of Rio Grande do Sul, both in Brazil. Their decease in 2015 was a great loss to the Brazilian computational mechanics

community. They were engineering researchers of the highest level, who conducted their lives in the most ethical way both in academy and as individuals. They inspired generations of young researchers in Brazil and will be remembered for the legacy they left.

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