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ECCOMAS Multidisciplinary Jubilee Symposium

New Computational Challenges in Materials,
Structures, and Fluids

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Preface

This book contains 23 papers presented at the ECCOMAS Multidisciplinary Jubilee Symposium - New Computational Challenges in Materials, Structures, and Fluids (EMJS08), in Vienna, February 18–20, 2008. The main intention of EMJS08 was to react adequately to the increasing need for interdisciplinary research activities allowing efficient solution of complex problems in engineering and in the applied sciences.

The 15th anniversary of ECCOMAS (European Community on Computational Methods in Applied Sciences) provided a suitable frame for taking the aforementioned situation into account by inviting distinguished colleagues from different areas of engineering and the applied sciences, encouraging them to choose multidisciplinary topics for their lectures.

The main themes of EMJS08 have a long tradition in engineering and in the applied sciences: materials, structures, and fluids. The solution of scientific problems involving fluids together with solids and structures, not to forget the materials the structures are made of, is of paramount importance in a technical world of rapidly increasing sophistication, referred to as the *Leonardo World* by the eminent German philosopher Jürgen Mittelstraß.

More recently, the main themes of EMJS08 have gained considerable momentum, owing to significant progress in nanotechnology. It enables resolution of a multitude of materials into their micro- and nanostructures. Covering aspects such as

- Physical and chemical characterization
- Multiscale modeling concepts, continuum micromechanics, and computational homogenization, as well as
- Applications in various engineering fields

the individual contributions to this book flow along different tracks of fluids, materials, and structures.

The sequence of papers follows the sequence of presentations at EMJS08. The editors wish to acknowledge the great efforts of the authors. Special thanks are due to Martina Pöll, Secretary of EMJS08, for the efficient administrative support.

J. Eberhardsteiner
Ch. Hellmich
H.A. Mang
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